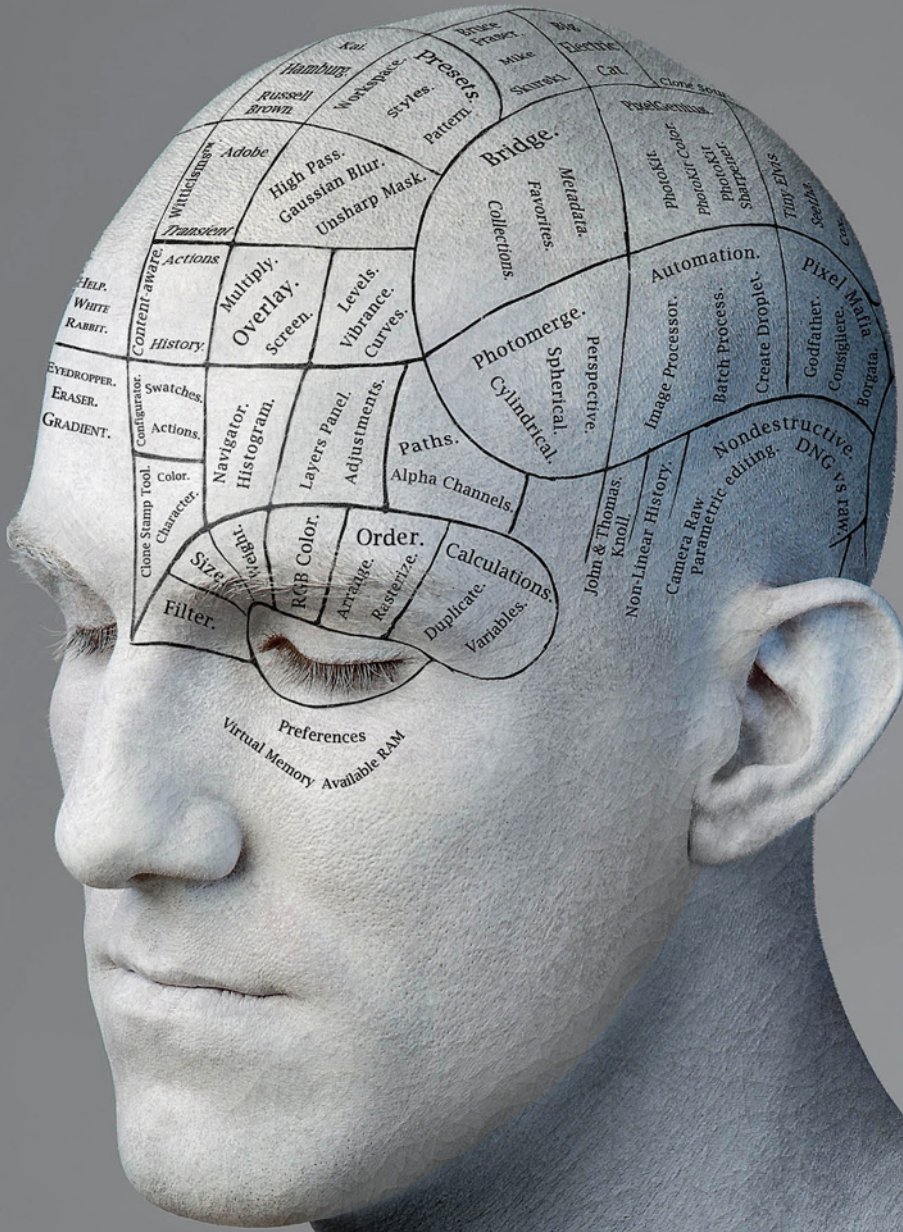


Adobe® Photoshop® CS5 for Photographers

The Ultimate Workshop



Martin Evening

Jeff Schewe



Adobe Photoshop CS5 for Photographers: The Ultimate Workshop

Martin Evening and Jeff Schewe



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Introduction

One of the problems with Adobe Photoshop is that the engineers always keep adding stuff to the program and as Photoshop has got bigger, there has been that much more to write about. This brand new addition to the *Photoshop for Photographers* series is intended as a companion to the main *Adobe Photoshop CS5 for Photographers* book. Rather than teach you all the basics of Photoshop, Camera Raw and Bridge, we wanted to concentrate more on what you can actually do with Photoshop. This book is therefore very much tutorial-based and packed with photographic examples shot by Martin Evening and Jeff Schewe. It is also unique in that it doesn't just show you how to use Photoshop, but explains the planning process leading up to the point where Photoshop is used and discusses some of the photographic techniques used, which are also illustrated throughout the book.

We have described this book as 'the ultimate workshop' and you will find that it has been broken down into thirteen different chapters, where each can be regarded as being like an individual workshop seminar program. Our aim has been to group the Photoshop techniques shown into this book into topic-related chapter sections. We hope this makes the book more easily accessible, as many of the chapters can easily be digested in a single reading session, just as if you were attending a real workshop event.

It's also rather ironic for this book to be co-authored by Jeff and Martin. Jeff was under contract to write a book tentatively titled *Photoshop for Photographers* back in the mid 1990s that for many reasons got scrapped. Martin had heard about Jeff's book project and had the good grace to ask permission to use the title – which Jeff gladly agreed to. Therein started a friendship between the two authors that now has them collaborating on this new *Photoshop for Photographers* title.

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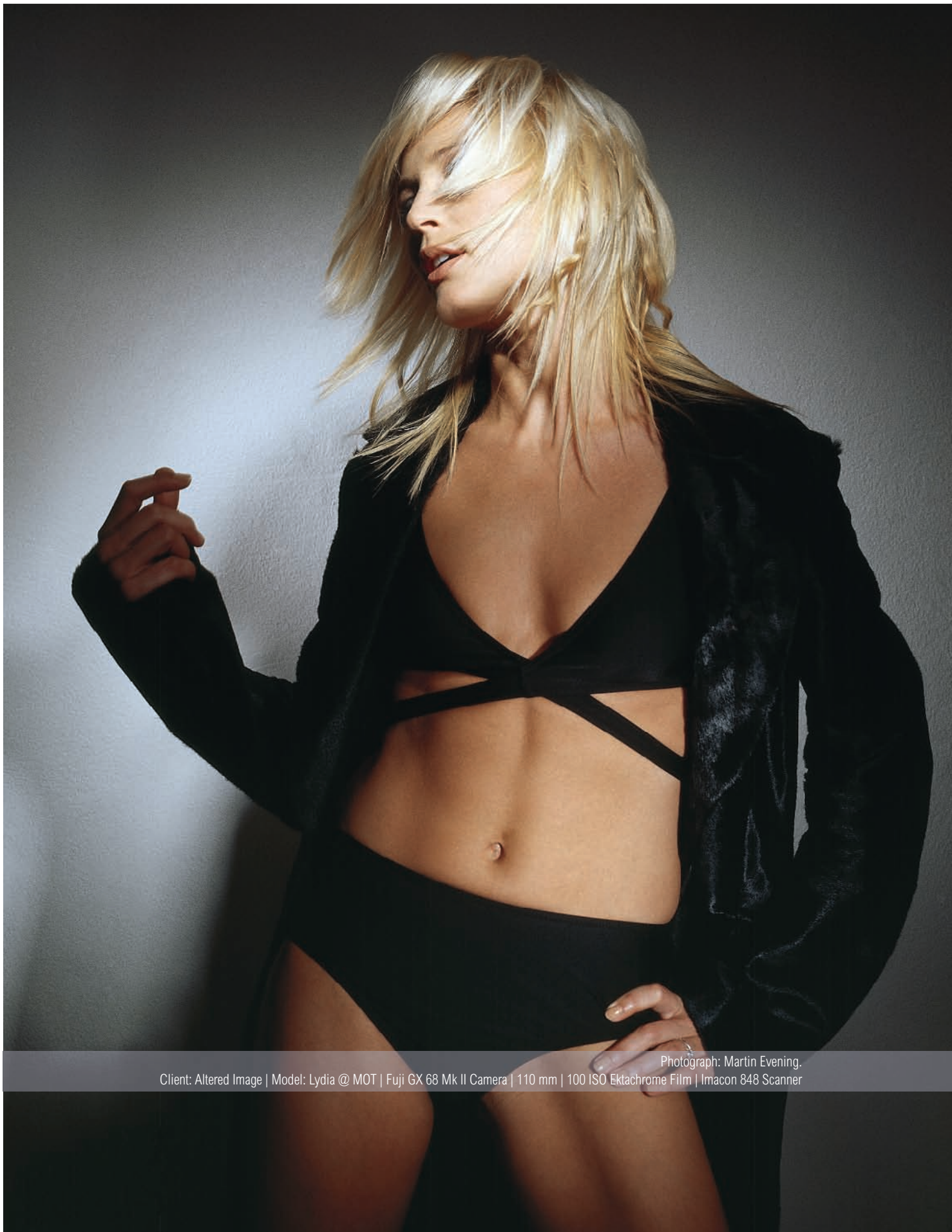
Quite a number of the photographs that appear in this book were shot in our London and Chicago studios. We would like to thank the following people for their assistance: our photographic assistants Harry Dutton and Mel Hill, Camilla Pascucci for makeup and hair, Harriet Cotterill for clothes styling, our models Courtney Hopper at Storm, Natasha DeRuyter, Alex Kordek and Lidia at MOT models, Stuart Weston, Neil Soni, plus Art Director, David Willett and Propabilities, Chicago, for supply of the studio props. We thank Kevin Raber of Phase One for the use of the P45+ digital back, Ben Rice for the loan of the HDR panoramic head equipment used in Chapter 9 and Imatest for the production of the lens test chart used in Chapter 3, along with Jon Tarrant and *What Digital Camera* magazine. We would also like to acknowledge the additional support in the early stages of the book production from Greg Gorman, Peter Krogh, Ian Lyons (the ‘Leprish Iricon’) and Marc Pawliger.

Thanks also go to all our friends at Adobe: Russell Brown, John Nack, Chris Cox, and co-architects Scott Byer and Russell Williams on Photoshop, and Thomas Knoll, Eric Chan, Zalman Stern and Tom Hogarty on Camera Raw. Obviously we owe a great debt of gratitude to Thomas and his brother John Knoll for authoring Photoshop in the first place and Adobe for having the brilliance to buy it. We also wish to thank Mark Hamburg for the years of ‘useful’ dialog (and for putting so many of our wishes into Photoshop).

Thanks also to the Pixel Genius crew: Mac Holbert, Mike Keppel, Seth Resnick and Andrew Rodney and our gone but not forgotten members Mike Skurski and Bruce Fraser. We miss them and so does the industry. We also give a nod to the Pixel Mafia, you know who you are...

Lastly, Martin would like to thank Camilla for all her love, support and understanding, and Jeff would like to thank his wife Becky and daughter Erica for their support and willingness to accept and love him (it isn’t easy). And to Max, the dog who will be remembered.

We also wish to thank you, our reader, and hope you get what we are trying to do and enjoy the learning process – we do, and it never ends...



Photograph: Martin Evening.

Client: Altered Image | Model: Lydia @ MOT | Fuji GX 68 Mk II Camera | 110 mm | 100 ISO Ektachrome Film | Imacon 848 Scanner



Chapter 1

Before you shoot

Concepts and planning before you use Photoshop

This book may be all about Photoshop and what you can do with the program, but we thought we would start by looking at where exactly Photoshop fits in to a photography workflow. While it is possible to do an enormous amount of work on the computer using Photoshop, just because you can doesn't mean you should. There is much to be said for taking a step back before you shoot an assignment and planning how you might end up using Photoshop, then shooting accordingly with that purpose in mind. Over the next few pages we have used a few studio shoot examples to illustrate this point.



Photo: © Martin Evening



Figure 1.1 Here is a simple example of where it makes more sense to extend the width of an image using Photoshop, rather than create the full-width scene ‘in-camera’.

Identifying the authors

To tell which of us wrote which sections of the book, a clue lies in the banner icons at the top of each page. The sections written by Martin use the **Me** symbol and those written by Jeff use the **Js** symbol, and the sections where we collaborated together show both. You’ll note the colors of these symbols are always designed to match in with the color of the chapter banners.

Before you shoot that picture!

In the days of film photography, we would often use a Polaroid™ as a way to test the lighting and show clients a preview of how the image would look. Photographers would often use the excuse that the quality of the Polaroid wasn’t up to standard and that it would look OK once they saw the film (by which time it would be too late!). Now, in the age of digital photography, photographers are tempted to say ‘we’ll fix it in Photoshop’. Of course, Photoshop can be used to fix almost anything, but the trick to becoming a successful and productive photographer is to be able to work out when it is appropriate to use Photoshop and when it’s better to get this right ‘in-camera’ first.

For commissioned shoots this is something that should be worked out before you pick up the camera, or earlier still at the layout stage. It all boils down to making the best use of your time. In Figure 1.1 you can see how Martin easily added extra width to a studio-shot picture using the content-aware scaling feature. It took a matter of a few seconds to do this in Photoshop, whereas it would have required extra space (and expense) in the studio to add extra width to the shot. For example, most seamless background rolls are only nine feet wide and Martin would have had to rent a studio with a wide enough cove and have it painted by hand to get the full backdrop width in camera.

Some people will call this cheating, while others will look at the economic necessities and conclude that using Photoshop in the post-production stage makes the most sense. These days a lot of movies and TV dramas are filmed on studio sets where many of the props and exterior details are missing and added in later. This kind of post-production work is so successfully done that you’ll hardly be aware of the artifice that’s involved.

Interpreting a brief

‘Briefs’ (normally called ‘layouts’ in the US) run the gamut from a highly detailed and exact rendering of what will be executed by the photographer, to a rough guide as simple as telling you whether the image is vertical or horizontal – and even that can sometimes evolve. Ideally, the relationship the photographer has with the art director or designer will determine how flexible the layout will be. The better art directors tend to be open to opportunities to improve the project with the input and creative ideas of the photographer.

All that said, it's not at all unusual for the layout to evolve (and hopefully improve) during the course of a project. When a layout is originally drawn, the reality of the final photograph is unknown – unless the layout has been created with stock photography, which can be a dual-edged sword. Ethically, a photographer should not merely copy another photographer's work and create a derivative work of the original. It's one thing to use another's work as inspiration, it's another thing entirely to infringe on the work of others.

Figure 1.2 Here is a simple example of an evolution of a layout to final printed ad.



Shooting multiple elements – intelligently

There's no question that a really good photographer can create a compelling image in a single shot and not have to rely on Photoshop to make it great. But given the limitations of time and budget, it's often easier (and just as productive) to break down a final image into its essential parts before shooting anything; then shoot those parts and assemble them in Photoshop. This is a prime example of such a shot.



Photo: © Jeff Schewe

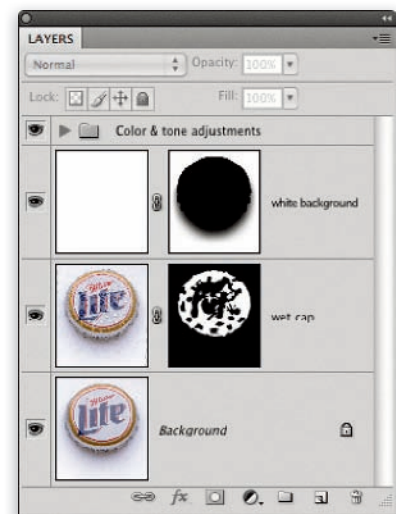
Figure 1.3 This is the final composite of two shots with retouching.

The shot of the Miller Lite bottle cap (Figure 1.3) was an assignment shot by me. Having experience of shooting liquid droplets, I knew that shooting the bottle cap with the droplets placed exactly correct would be tedious and involve lots of very detailed work up close. It would be a pain... So rather than even try to accomplish the final result in a single shot, I chose to shoot two shots: one with the bottle cap completely dry with the lighting finessed and the image optimized for the logo text, and a second shot where the water droplets were allowed to go where they wanted (Figure 1.4). I made no special effort to keep the background dry.



Figure 1.4 These are the two raw shots before layering and masking.

By planning in advance to shoot the assignment in two shots, I was able to simplify the individual shots to the point where the image assembly was quite simple. Also, by telling the art director that two shots would be better from the very start of the assignment, doing the two shots was not seen as a failure to ‘get it’ in one shot but a better way to accomplish the goals of the assignment. It also gave the art director the opportunity that art directors love so much: the chance to direct. But instead of looking through the ground glass of a view camera (whose image is upside down) and trying to direct the precise placement of water droplets, he could direct me sitting at the computer and add, delete or move them in Photoshop. To be honest, it didn’t necessarily take less time but it was certainly less tedious dealing with a layer mask rather than the difficult task of placing the real water droplets. Using the separate elements approach was also much more efficient and precise, which led to a better result – the goal of both the art director and me.



Multi light blending technique

Shooting in the studio with controlled lighting can lead to wonderfully lit still-life images. But you are often faced with the realities of optics and physics, and the difficulties of getting light exactly where you want it. As a result, I have become adept at shooting subjects under varied lighting conditions and directions and then compositing the resulting elements in Photoshop. Figure 1.5 shows the two original captures. The only real difference is that the light was moved from the upper left to the lower right of the image between shots. Both captures were processed in the same way and were maintained in exact registration between the exposures. The trick then was to ‘paint with light’ by using the second layer’s layer mask to determine the precise visibility of that layer.

This approach – locking the camera down and shooting multiple exposures with different qualities of light (such as a Hard Light mixed with a Soft Light) or, as in this example, with the same light from different directions – is a creative approach that marries the best of photography with the efficiency of Photoshop. Sure, you could labor the long time it would take to finesse the lighting using two separate light sources, but why when this alternative is so simple (and easy)?

There are some caveats: you really should have a very stable shooting platform and it’s ideal to keep the lighting rather simple. However, with Photoshop CS5’s Auto-align function this has become less mission critical. Ironically, for this book I did test

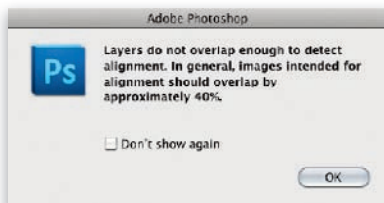


Figure 1.6 The Auto-align command prompted this warning when trying to align the two leaf layers.



Figure 1.5 The capture on the left was the starting position of the light. After capturing and evaluating the first shot, the light was moved 180° and the second capture was made.

the Auto-align command on these layers and received the warning shown in Figure 1.6. It seems that the lighting was so different that the Auto-align logic was fooled. This wasn't a problem in this case since the registration was already excellent.

Figure 1.7 shows the final layer stack with the layer mask on the 'lower left' layer that modulated the visibility of that layer. Some areas were completely opaque while other areas were blended in partial opacity. The white areas of the layer mask allowed all of the lower left layer to show through. Figure 1.8 shows the final result 'painted by light'. There weren't a lot of tone and color adjustments made. The primary adjustment was a Hue and Saturation increase and a midtone contrast bump to pop some of the detail. More about those types of adjustments later in the book.

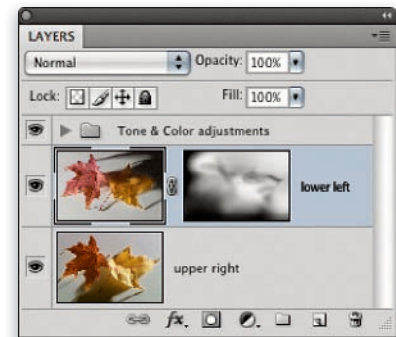


Figure 1.7 The final layer stack (with the adjustments grouped for brevity).



Figure 1.8 The final blended image.

Complex composite work

The previous examples were simple to composite because of the nature of the images. However, Figure 1.9 was not in the least bit easy to assemble. All of the individual elements had to be shot separately. However, the nature of the assembly dictated that each element shot had to have matching lighting that would enable the final assembly to look convincing. The element shots (see Figure 1.10) were set up so that the lighting would cast a shadow in the correct direction and provide realistic clues as to how to make the synthetic shadows that would be made in Photoshop. The additional challenge was to rig each shot so the model's action would be real. This required tying off the pickaxe fellow's suit to make the action look more real. For the shot with the two people



Figure 1.9 Left is the original layout provided by the client. Above is the final retouched composite.



Figure 1.10 The images above were shot with 120 mm color transparency in the studio. The two pie shots were done on 4 x 5 film. The sky background was studio stock. All of the element shots were outlined using the pen tool to create paths. Separate paths were made from the real shadows and then remade in Photoshop.

with the saw, they did actually have to engage with each other so their expressions would be real. The hatchet girl needed to be on a ladder and even though I rigged a line for the lady with the pickaxe (she couldn't actually hold it over her head), it was important that the lighting and the shadow were correct. Even the 70 year-old fellow with the shovel (I didn't know the gentleman was 70 at the time – but the model did actually have fun on the shoot) had to be suspended by real rope to look realistic.

The shot that actually dictated lighting direction and quality was the background image. Since the sunset had a low side light angle, the rest of the elements had to be shot to match. Try as he did, the food stylist couldn't get 'the perfect pie' so I took parts from two different pies for the final composite.

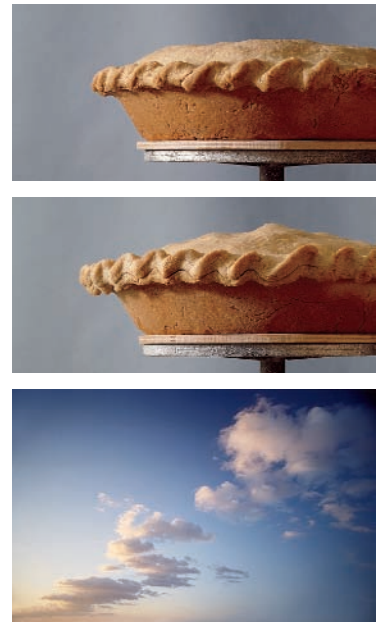




Figure 1.11 Knowing the end photograph will be edited in Photoshop does mean that one can take shots such as the one here, using an extreme wide-angle lens, and not have to worry if the model's head happens to overlap the edge of the backdrop. This kind of problem is easy to fix in Photoshop and you don't lose the shot.

Fashion and beauty retouching

Where would the fashion and beauty industry be without retouching? It's been used for many years now and has had quite an impact on the way fashion images look in magazines.

A Scottish hairdresser I worked with once told me how the clean hair lines and cuts shown in the photographs created for Vidal Sassoon in the sixties made a huge impression on other Scottish hairdressers and how as a result they refined their cutting techniques to match the precision in the photographs that they had seen. Little did they realize that the pictures had actually been retouched, but ever since Scottish hairdressing has become world famous for its technical precision!

One might argue that the ridiculous levels of retouching used on some photographs have become too much, but we reckon that good retouching work should be retouching that you don't notice. These days it is really easy to carry out effective skin retouching using tools such as the healing brush and now also the spot healing brush with the new content-aware healing mode. The best advice here is to always carry out your retouching on separate layers and when it comes to any work that is done to smooth the skin tones, such as a paint layer or skin blurring layer, then fade the opacity so that the effect is made more subtle. Figure 1.12 shows an image that is featured later in this book to demonstrate a Photoshop hair coloring technique. There have been several occasions where I have worked on a series of hair coloring shots to demonstrate a range of hair colors and it has been necessary to color a model's hair different shades of color (matching a sample color). You have to bear in mind here that to dye the hair for real, the models would be required to undertake a skin patch test to check for chemical sensitivity and the coloring process itself can take up to several hours to complete. So although doing it in Photoshop may not be so truthful, it is the only way many clients can afford to get the exact hair color look they are after and avoid paying high model fees.

I also believe one can now afford to be somewhat looser about the way you shoot. In the past, it was critical that the models kept within the bounds of the backdrop, whereas now it doesn't matter quite so much (as I have shown in Figure 1.11). I quite like having the freedom to shoot to capture movement and gesture knowing that Photoshop can be used to extend the backdrop if necessary.



Figure 1.12 Here is a before and after example of a photograph in which I carried out basic retouching to remove stray hairs, smooth the skin texture and adjust the color of the model's hair.

In this respect, Photoshop offers more ways to be creative because you have fewer restrictions.

When it comes to lighting for beauty and fashion photography, there is also more opportunity to shoot without limits. After a long career learning how to light precisely I certainly know how to control my lighting, yet I do now appreciate the freedom Photoshop gives me to break the rules and shoot without regard to the precise balance of lighting or optimal contrast. For example, I find that I now tend to light that much harder. I have always liked the drama that you get with strong, directional light, but at the same time been wary of the problems you get with strong harsh shadows on the face. However, it is now relatively easy to smooth these out in Photoshop and have the best of all worlds. Some might consider this a lazy approach to photography, but if Photoshop occasionally allows you to break the normal rules of lighting, why not allow yourself to experiment?

When not to use Photoshop

I recall that the client had originally contacted me because I was thought of as some sort of ‘computer expert’. The idea was to create an image of a melted phone on the computer (Figure 1.13). I quickly realized that the client was both overestimating the ease of doing something like that in CGI and vastly underestimating what the costs would be. It would be far better and less costly if I just put a phone in the oven and melted the darn thing.

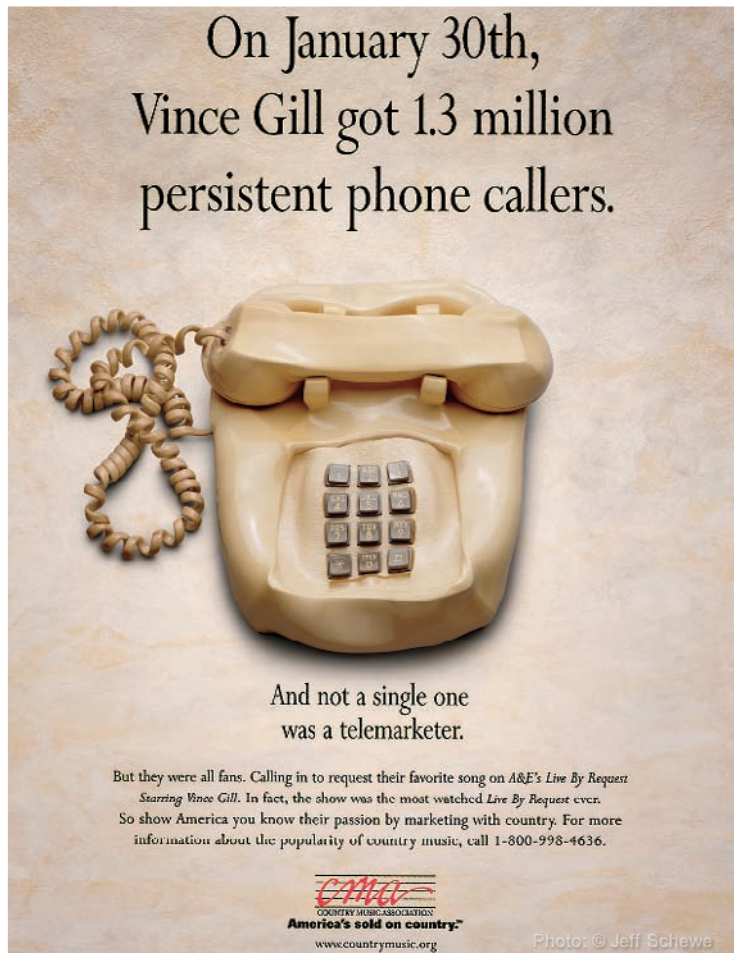


Figure 1.13 This figure shows the final image as it appeared in the ad. The background was shot separately and the layered phone (with shadows) dropped on top.



Figure 1.14 The melted phone on the left was shot on a medium gray background to minimize the reflections in the plastic. The image on the right is the retouched and layered phone with synthetic shadows.

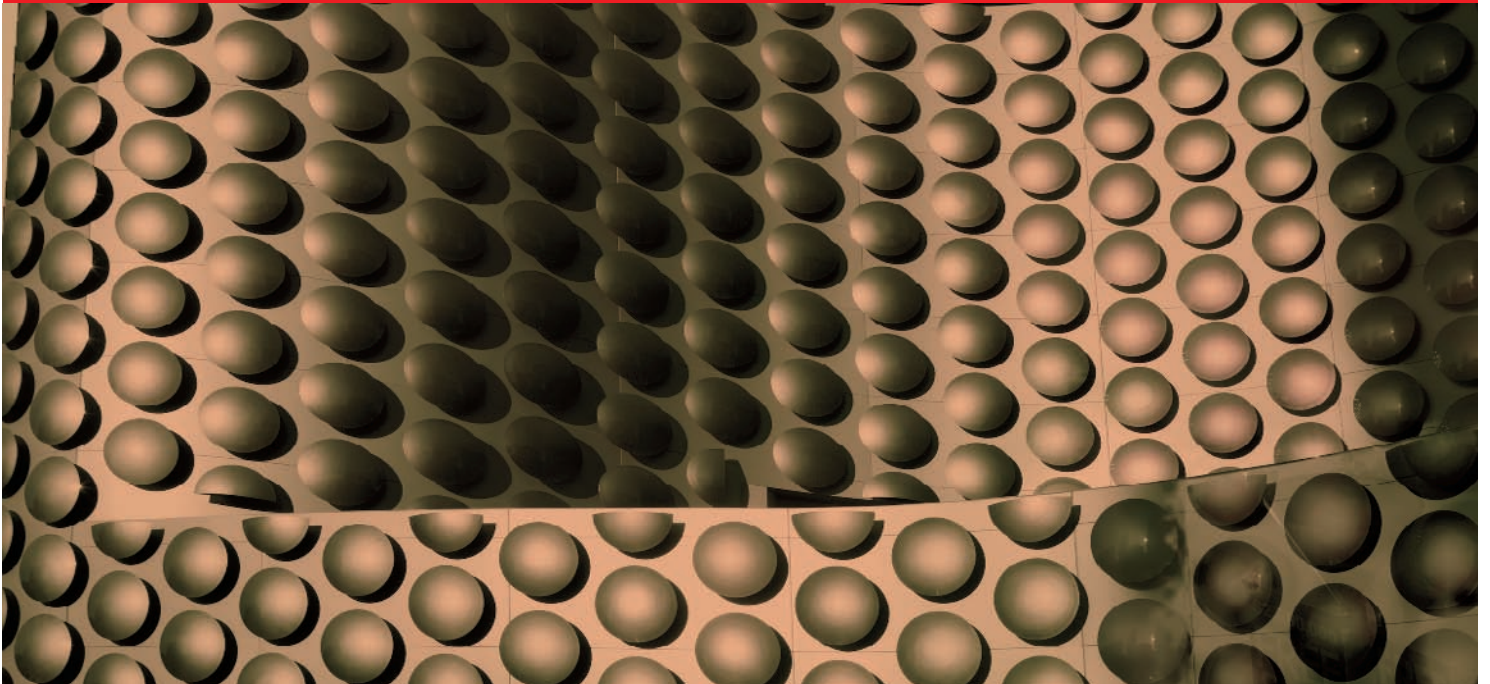
The first test melt wasn't a huge success. The resulting mass of bubbling and blackened plastic looked like a biological experiment run amuck. But subsequent tests led to the technique of a longer time in the oven at a lower heat.

The key was to remove as much metal as possible and simply let gravity do its work. The longer time in lower heat also enabled me to prod certain areas and angle the base (a cookie sheet) while still in the oven. Clearly, as shown in Figure 1.14, there would be the need for some pretty heavy retouching after the melted phone was cooled. But the amount of work was minimal compared with trying to melt the phone in Photoshop.

Which really is the thrust of the main point we are trying to get across in this first chapter. There are things you can do very easily in front of the camera that would be very difficult after the fact in Photoshop. Yet knowing how to shoot for digital imaging can greatly ease the post-production burden and substantially improve the final result. If you have skills as a photographer and skills as a digital imaging artist, you can improve the final result (and make your life easier) by carefully choosing when to do what and by which means: photographic or Photoshop.



Photograph: Jeff Schewe.
Canon EOS 10D Camera | 17-35mm lens at 23 mm | 1600 ISO



Chapter 2

Camera Raw workflow

Getting things right in Camera Raw first

With this chapter we wanted to show you some of the key benefits of using Camera Raw to carry out the initial image processing. You see, if you shoot using the raw mode on your camera, almost everything you want to do to an image can be done using Camera Raw first. And if you are using Lightroom, you can use the exact same controls that can be found in the Develop module to prepare a raw image. Our late colleague, Bruce Fraser, used to joke that Photoshop makes an excellent plug-in for Camera Raw. We don't think Bruce was completely joking when he said this. You really should use Camera Raw as your first port of call when editing your photos.

Camera Raw's history

Thomas Knoll, the co-author of Photoshop, is the founder and principal engineer of Camera Raw. Camera Raw 1.0 was released as a stand-alone product for Photoshop 7 and sold for \$99. Camera Raw 2 was bundled with Photoshop CS, which was released in October 2003. Contributing engineers are Zalman Stern and Eric Chan. Mark Hamburg has also contributed to the Camera Raw processing pipeline and was the founder of Adobe Photoshop Lightroom, which built upon and added to Camera Raw's processing.

Optimizing images

Camera Raw or Photoshop?

When Adobe launched Camera Raw it was designed as a raw file format import plug-in that allowed Photoshop to access raw digital captures. It can now be argued that Camera Raw has been turned into its own editing domain called 'parametric editing' and, in some ways, challenges Photoshop for image editing of digital photographs. But don't lose sight of the fact that Camera Raw's main role is still to open images into Photoshop.

Inevitably, there will be a degree of confusion about what to do to images in which domain: parametric or pixel editing. The answer is really rather simple – use the best tool for the task at hand. Using Camera Raw is optimal for raw capture tone curve adjustments because you are working with the entire linear tone range of the raw capture. Waiting to do that in Photoshop would mean leaving image quality on the table. The same holds true for adjusting the

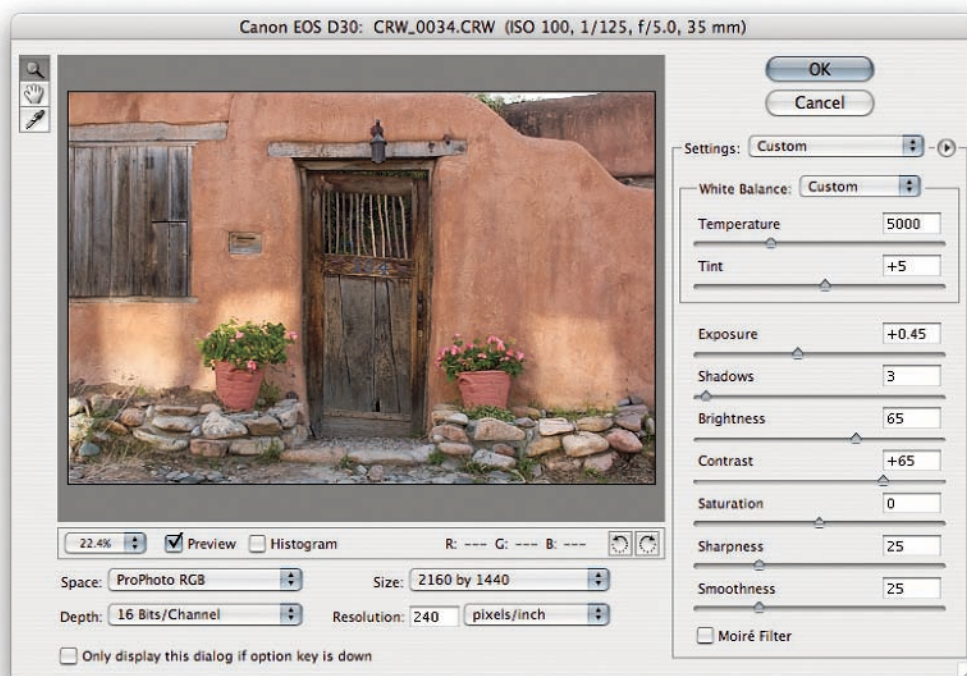


Figure 2.1 Camera Raw version 1.0 in Photoshop 7, released February 19th, 2003.

white balance of a raw capture. Nothing in Photoshop can rival the accuracy and efficiency of Camera Raw's white balance tool. If your camera sensor has a dust spot, you can use the spot removal tool in Camera Raw to remove a spot on one or one hundred captures. Therefore, doing these tasks in Camera Raw is more efficient than in Photoshop. Yet for all of its strengths, Camera Raw is not a pixel editor (the adjustment brush and gradient filter notwithstanding). When you need pixel-accurate masks or image composites, you need Photoshop.

The best approach is to devise a strategy and employ the correct tactics to achieve it. The strategy we like to use is the 80–20 rule (also called the Pareto principle) where the majority of the work can be done with the least amount of effort. So, Camera Raw is tactically employed to make mass adjustments accurately, quickly and efficiently while Photoshop is tactically employed on only a few select images that are truly worthy of the extra effort.

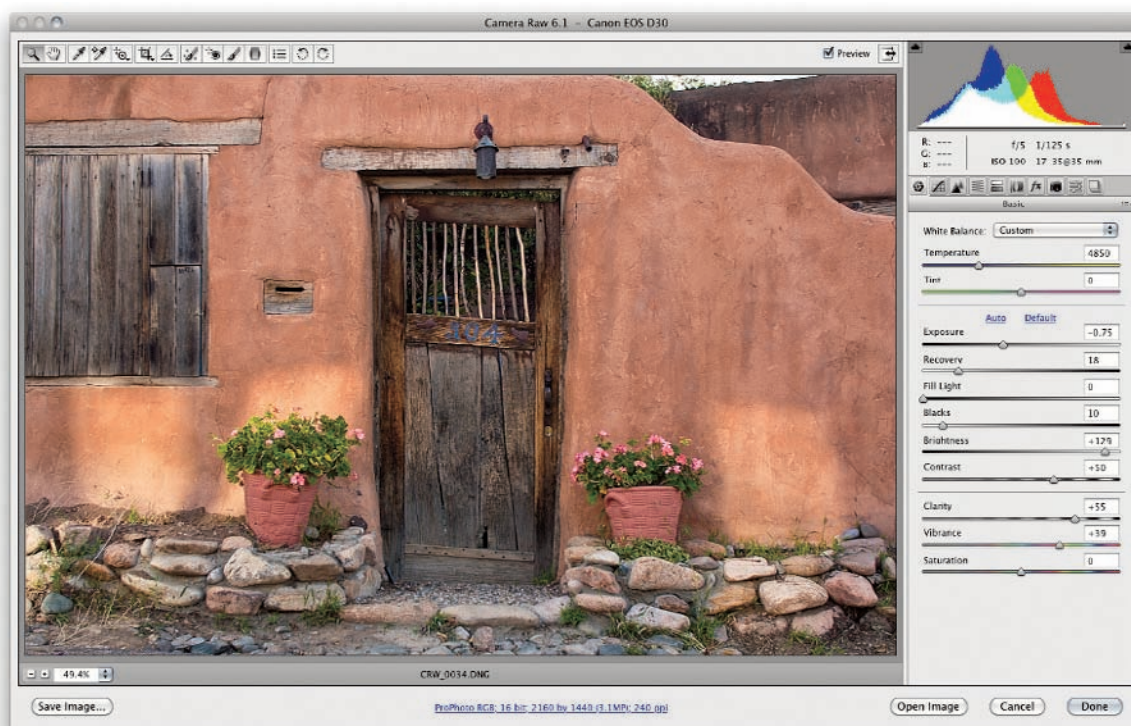


Figure 2.2 Camera Raw version 6.1 in Photoshop CS5, released June 1st, 2010.



Figure 2.3 The Camera Raw Camera Calibration panel showing the Process Version drop-down menu.



Figure 2.4 The Process 2003 badge which also behaves like a button.

Process 2003 Rendering

While the engineers tried very hard to maintain the older Process 2003 rendering capability, Process 2003 is still slightly different and not an exact match to previous renderings. Since the noise reduction was removed from the demosaicing engine in Camera Raw 6, Process 2003's rendering is slightly noisier than previous versions' rendering. If you need to match the noise signature of previous renderings, we suggest adding 15–20% to the Process 2003 Luminance Noise Reduction settings. This will make up for the removal of the previous versions' built-in noise reduction.

Process Versions in Camera Raw

Camera Raw has changed considerably since it was first released. However, it wasn't until Camera Raw 6 in Photoshop CS5 that the engineers had to consider the consequences of substantially changing the basic rendering in Camera Raw.

For version 6, the Camera Raw team made fundamental changes to the demosaicing and noise reduction as well as more gentle changes to the Recovery, Fill Light and Sharpening controls. These changes, while universally deemed improvements, did necessitate the introduction of a concept called 'Process Versions' to allow users to retain the rendering of previous versions. Figure 2.3 shows the Process Version drop-down menu found in the Camera Calibration panel. By default, raw images that have not had their settings modified beyond the Camera Raw 'default' will open in Camera Raw 6 already set to Process 2010 (Current). Images that have user-modified settings of any kind will by default open in Camera Raw 6 as Process 2003. Figure 2.4 shows the Process 2003 warning badge that appears in the lower right corner of the Camera Raw 6 preview window. The badge also doubles as a button to change from Process 2003 to Process 2010. In addition to clicking on the badge you can switch between versions via the Camera Calibration panel (Figure 2.3). Camera Raw 6.2 added the ability to create presets using the Process Version as a subset of a Camera Raw preset. This allows you to create a Process Version preset that can be applied in Bridge before even opening an image in Camera Raw.

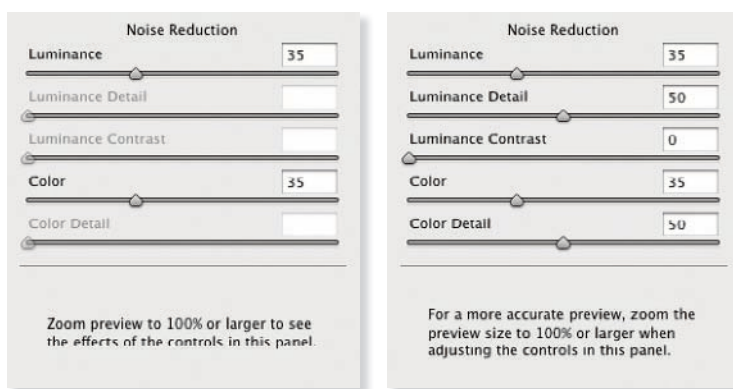


Figure 2.5 Comparisons of the Camera Raw Detail panel showing the Noise Reduction differences between Process 2003 (left) and Process 2010 (right).

The biggest and most obvious difference is found in the Camera Raw Detail panel's Noise Reduction settings as shown in Figure 2.5. Process 2003 only allows older single Luminance and Color noise reduction settings. Process 2010 offers the addition of Luminance Detail and Contrast as well as Color Detail. The Luminance Detail slider controls the noise threshold for determining what is noise and what is image detail. Sliding to the right preserves more image detail. Dragging to the left increases image smoothing but at the risk of losing image detail. Luminance Detail allows you to preserve image contrast which might be lowered when using high luminance amounts. Both of these adjustments are really only obvious when working on high ISO images. The Color Detail slider allows adjustment of the detail of the color edges. Lower numbers may cause loss of color saturation with thin edges while too high a number may result in color blobs.

The best way to get the hang of using the Process Version renderings and the new noise reduction controls is to practice using them. You'll be better able to see the results by zooming in to 200–400% zooms and the improvement in noise reduction is more obvious with high ISO captures. Figure 2.6 shows the full image that is shown at 400% zoom in the detail images in Figure 2.7 below.



Figure 2.6 The full frame of the image captured with a Canon EOS 10D at ISO 1600. The area of the detail image is circled.

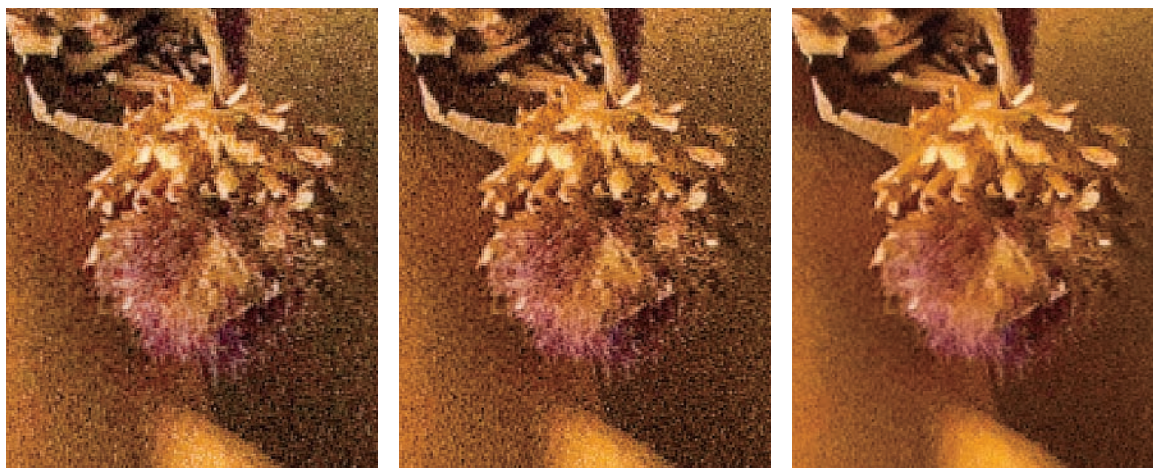


Figure 2.7 Comparisons of the Camera Raw Detail panel showing default rendering differences between Process 2003 (left) and Process 2010 (middle). On the right is the image optimized with the noise reduction settings shown in Figure 2.5.

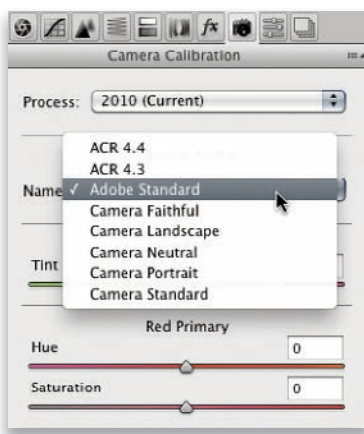


Figure 2.8 The Camera Raw Camera Calibration panel showing the drop-down menu of available profiles.



Figure 2.9 A synthetic ColorChecker card made in ProPhoto RGB.

Camera Profiles in Camera Raw

When Camera Raw was first introduced, one of the more controversial aspects of image quality was the Camera Raw default color rendering. Many thought the color was inaccurate (or at least didn't match the color produced by the camera JPEG or camera software). Adobe took heed and introduced the DNG Profile addition to the DNG specification with DNG version 1.2.

Whether you were in the camp that thought Camera Raw's color rendering was fine or the camp that thought it sucked is moot – the DNG Profiles have now changed the Camera Raw rendering. If you want the same color rendering as your camera JPEG, you can pretty much match it. Figure 2.8 shows the Camera Calibration panel of Camera Raw 6. The default color profile is the Adobe Standard profile. This profile is designed to be colorimetrically accurate and an improvement on the previous table-based profiles (shown as ACR 4.4 and 4.3). The profiles starting with the name 'Camera' are designed to emulate the in-camera settings available as designed by the camera maker (although the actual names will vary). The drop-down menu in Figure 2.8 is for a Canon EOS1DS Mk III, while other cameras will have names that align with their own camera 'looks'.

For comparison, Figure 2.9 shows a synthetic Macbeth ColorChecker card. The bottom figure shows shots of a mini ColorChecker card that has been shot in daylight. The far left image of Figure 2.10 was rendered using the Adobe Standard DNG Profile. The middle image was rendered using the Camera Standard profile and the image on the right was a camera JPEG with the



Figure 2.10 Comparisons of the Adobe Standard profile (left), the Camera Standard profile (middle) and a camera-produced JPEG file (right).

camera set to sRGB. As you can see, the Camera Standard and JPEG are a close match. However, in terms of accuracy, the Adobe Standard rendering is a closer match to what the ColorChecker colors are supposed to produce. What does this prove? That color rendering from raw files is open for interpretation – there really is no single ‘right’ answer but there may be more accurate answers.

It doesn’t really end here either. Adobe has released a free software utility called DNG Profile Editor which enables users to create their own DNG Profiles through manual editing or by using shots of ColorChecker charts. The documentation available is extensive, so if you are interested we suggest you download the DNG Profile Editor from <http://labs.adobe.com> and try it yourself (be sure to read the documentation). For real-world examples of the different renderings using the vendor matching profiles, see Figure 2.11 below.


Color accuracy

Whether you spell it color or colour, photographers often think accurate is best. Not really. However, one of the most successful film launches ever was Fuji Velvia, which was anything but accurate. What photographers usually want is pleasing color and Camera Raw has 40 controls dedicated to color adjustments (not including the adjustment brush). But try to think of the DNG Profiles not as color correction tools but more as a color rendering tool that offers options for the start of your color editing needs.



Figure 2.11 This shows comparisons of the DNG Profile rendering. Note, the naming convention will vary by camera manufacturer and not all cameras will have all variations.

Highlight checking

In Camera Raw there are several ways you can check that the important highlight information is preserved. One way is to click the highlight clipping warning in the Camera Raw histogram (circled in Figure 2.12). Alternatively, if you hold down the  **alt** key as you drag the Exposure or Recovery sliders, you will see the preview image change to show a threshold mode display, in which the clipped areas will appear colored (indicating which colors are clipped) or white (to indicate that all colors are clipped). You can use this as a guide to make sure important detail isn't clipped. Lastly, you can move the cursor over the highlight areas of the image and check the RGB values to see if these fall within an acceptable range for print output. Here, you usually want to make sure that the brightest areas of highlight detail don't go lighter than, say, 245,245,245.

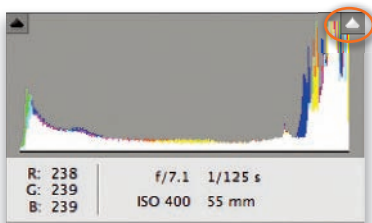


Figure 2.12 The Camera Raw histogram.

Optimizing the image tones

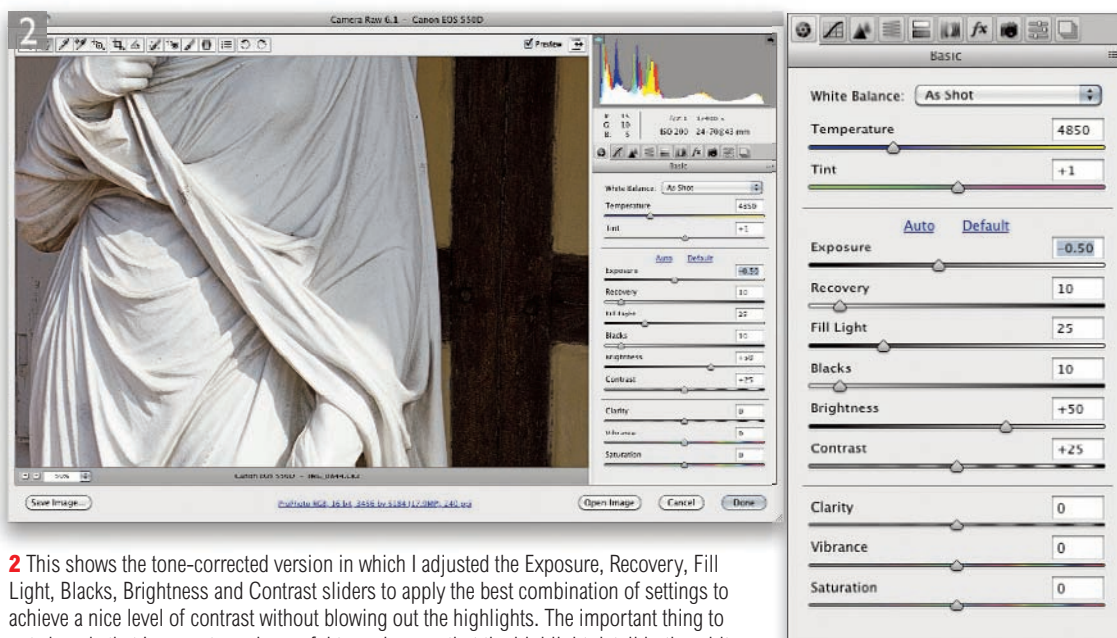
This section deals with a few of the ways you can fine-tune images in Photoshop to improve their appearance. If you want to learn more about the basics of Photoshop image editing, then we reckon you'll find the Image editing essentials chapter in the main *Adobe Photoshop CS5 for Photographers* book a useful guide to working in Photoshop. To start with though, we thought it worth making a few points about how to optimize the shadows and highlights and dispel a few myths.

Optimizing an image in Camera Raw

A lot of people have got confused about how you are supposed to set the shadow and highlight points in Camera Raw and Lightroom, and why you don't have the same type of Levels controls as you do in Photoshop. Basically, you will sometimes read that the black point output levels should be set to an RGB value like 12, 12, 12, and the white output levels should be set to, say, 245, 245, 245. There are sound, historical reasons for such advice, because you don't want the blacks to clip to 0, 0, 0, when you send a file to be printed, since any blacks that are darker than a certain value will all clip to black. Likewise, you need to ensure that essential highlight information doesn't all burn out to paper white when printed. Yet in Camera Raw there are no output levels settings options. This is because they are not needed when editing images for RGB output and we'll explain why here.

When it comes to optimizing the highlights, you only need to worry about the non-specular highlights, which are basically the brightest whites that contain important tonal detail. With specular, or shiny whites, you can safely let these clip. So although you do have to be careful not to clip the highlights when adjusting the Exposure slider, in practice most pictures do contain some specular highlights. So, if you set the highlight clipping to clip these the important detail highlight information will usually be safely preserved within a margin of safety. Where there are bright areas in a picture that contain important detail, we first make sure that the threshold clipping display confirms that these areas are not significantly clipped and then use the Recovery slider in Camera Raw where it is necessary to make absolutely sure the highlight detail is preserved in these areas.

Optimizing the highlights



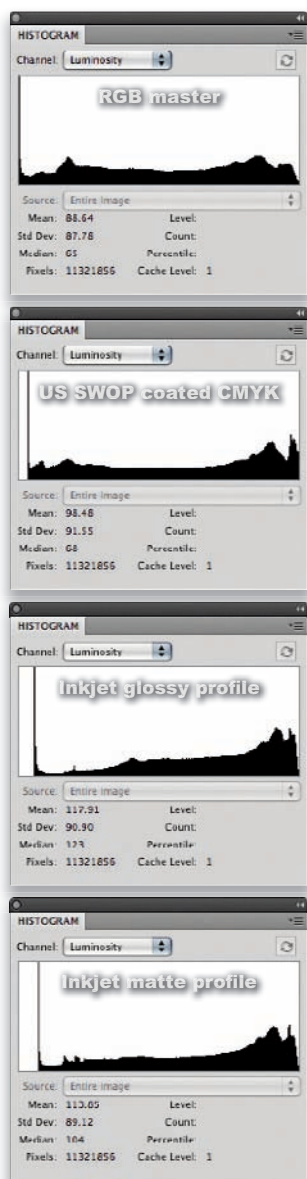
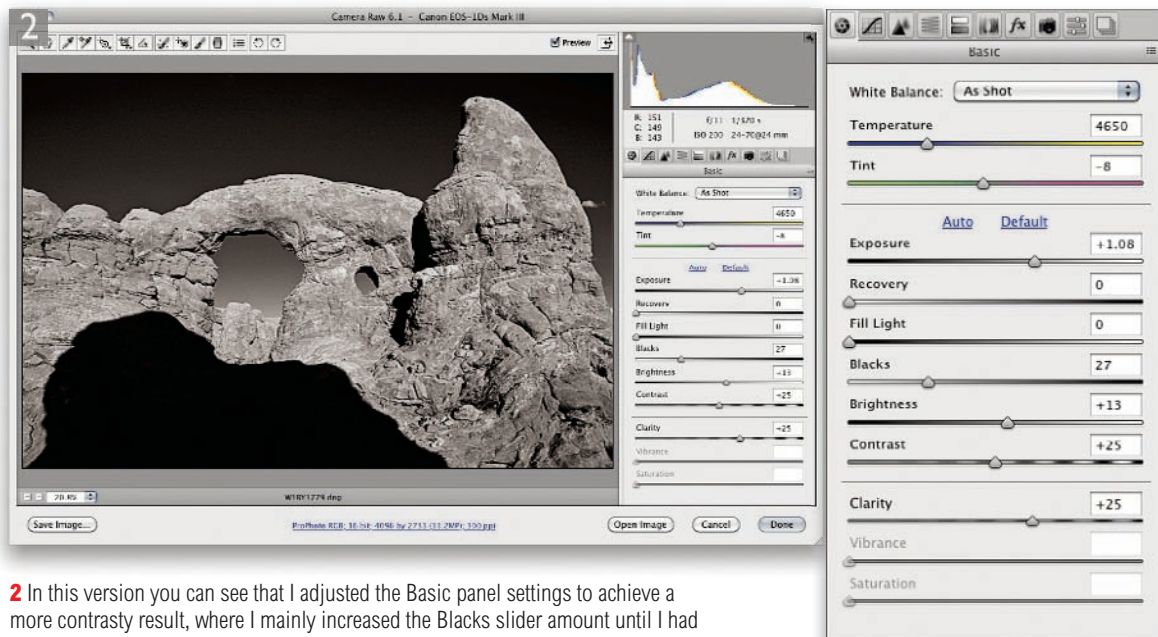
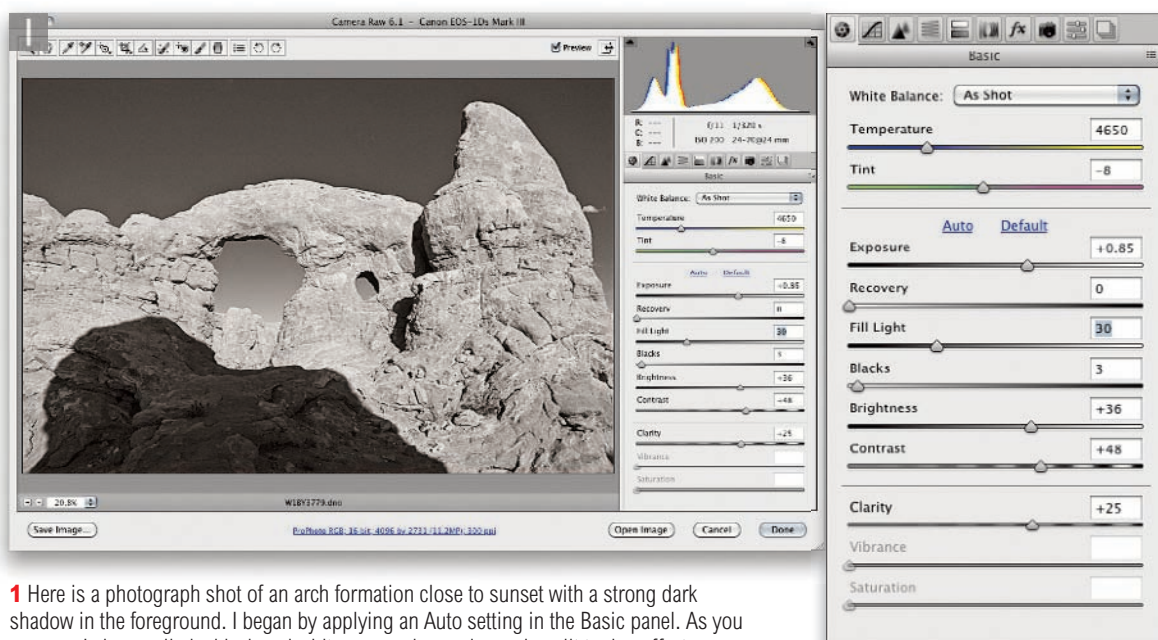


Figure 2.13 This shows, from top to bottom, the histogram for a Camera Raw processed RGB image, a conversion to CMYK, a conversion to a glossy inkjet paper profile and a conversion to a matte inkjet paper profile.

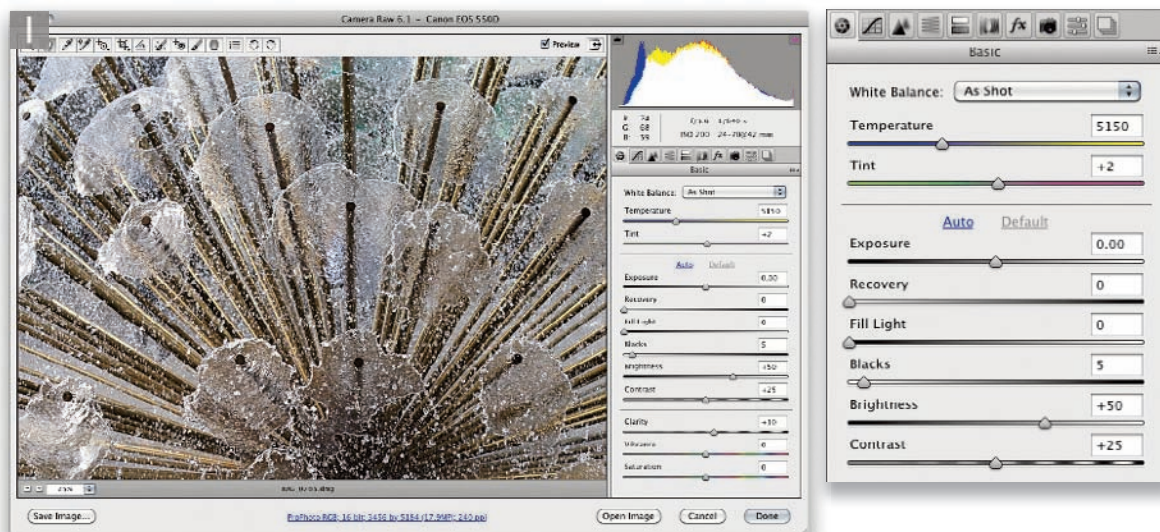
Optimizing the blacks

When it comes to adjusting the Blacks slider, the choice is simple: where are the blackest blacks and how much do you wish to clip them? Just as there is no one CMYK space that fits all, there is no one setting for the black point that will correctly set the blacks for every type of print output. Where you read advice to set the blacks lighter than 0, 0, 0, this dates back to the time before Photoshop 5, when there was no other way to ensure that the blacks in a photograph would print correctly without clipping. Some people have expressed concern that Camera Raw only allows you to adjust the input clipping levels values and that there is no control available for setting the output levels to something higher than 0, 0, 0. In actual fact, an output levels control is not really necessary these days, since the profile conversion can take care of all this for you and does everything automatically. With the advent of ICC-based color management now being built into Photoshop, this preparation step is no longer required and it is fairly easy to prove why. For example, in Figure 2.13 I opened a Camera Raw processed photograph in Photoshop (where the shadows has been deliberately clipped to go to solid black) and set the histogram display in the Photoshop Histogram panel to 'Luminosity'. The top histogram shows the Photoshop histogram for a Camera Raw processed RGB master image. Below that you can see the luminosity histogram for a CMYK converted version and below that a conversion to a glossy inkjet profile, followed by a matte inkjet paper profile. In these screen shots of the output-converted histograms you can see that the black point is automatically indented. This demonstrates how the profile conversion takes the guesswork out of setting the blacks, as well as how the amount of black point compensation actually varies for each different type of print output. This is because an ICC profile is able to work this out precisely, according to each type of print output.

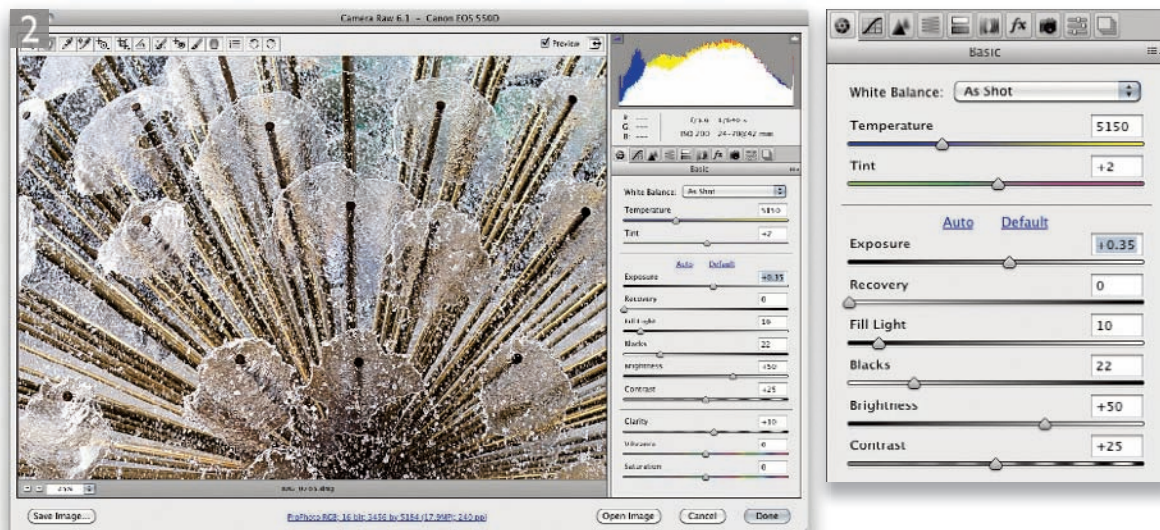
The photograph shown on the page opposite was shot at Arches National Park near Moab, Utah. In the accompanying steps I show how I adjusted the settings in Camera Raw to deliberately clip the blacks so that the foreground shadow appeared completely black in the final Camera Raw-edited version of the picture. Another typical example would be a photograph of an object shot against a black backdrop, where you might also want to force any remaining shadow detail in the backdrop to go to a solid black tone.



Optimizing both the highlights and blacks



1 To complete this section on optimizing images in Camera Raw I have selected here a photograph where, as in the previous example, the blacks needed to be clipped, but it was also OK to clip the highlights as well.



2 In this adjusted version, I raised the amount for the Blacks slider to ensure the shadows were sufficiently clipped. In this particular image it was not necessary to preserve the extreme highlights, since I wanted to allow the bright reflections coming off the water to clip, and burn out to white. You'll notice here how I also raised the Exposure slider setting slightly.

Essential image editing steps

With so many tools and ways to edit photographs, it is easy to get confused when working out what is the best way to edit an image in Photoshop. This book offers advice and tips on how to improve the look of your pictures, but we find that 90% of the photographs we take can mostly be improved by applying the following editing steps: lens corrections, crop, color, tone, finesse, capture sharpen, noise reduction and spotting. We do this all in Camera Raw when processing our raw photos, because we find it to be the most efficient workflow available. We know some people have been put off shooting raw because they think it makes things complicated, but when you study the Basic controls in Camera Raw and Lightroom, they really aren't that difficult to master. In fact it seems to us quite odd that people are happy to shoot JPEG because it's 'simpler', yet they then end up jumping through all sorts of complicated hoops in Photoshop to perfect their images.

Camera Raw allows you to work both smarter and faster so you can spend more time taking pictures rather than getting bogged down in making endless photo adjustments. Plus you don't just save time editing single photographs. Get one photograph to look right and it's easy to synchronize all the adjustments across other images that have been taken in the same sequence. Essentially, our message is this: Why make things more difficult for yourself? The controls in Camera Raw are expressly designed to make the photo editing process easier to understand, while offering the ultimate in image quality as well as flexibility. Simple doesn't mean you have to compromise on quality. Adobe has devoted the best part of seven years to enhancing the Camera Raw editing process because in this day and age it makes more sense to carry out the color and tone editing working from the raw capture data. As Camera Raw has got better we have ended up doing all our major tone and color corrections in Camera Raw or Lightroom, leaving Photoshop as the program we use for the major retouching work.

As we say, nine times out of ten we can edit a photograph completely in Camera Raw using the following steps. For the remaining 10% of images either we make fuller use of the other Camera Raw tools such as the Tone Curve, HSL and Effects panels, or we use special techniques in Photoshop such as the Midtone contrast enhancing technique that is described in Chapter 3.

To help explain our approach, I thought I would show all the steps that were used to edit a single image in Camera Raw. Figure 2.14 shows the starting point for this series of steps. This isn't a particularly special photograph, as I deliberately chose a fairly typical image that would allow me to show how a few small adjustments here and there can help improve the look of a photo. You can access this image from the DVD, but you should be able to apply the steps shown here to almost any raw photograph you choose to edit in Camera Raw. The sequence of steps I applied to this particular photo are typical of how both of us approach our Camera Raw/Lightroom editing. Looking at the final version that's shown in Figure 2.29, there isn't really anything more that would be needed to be done to this photo in Photoshop other than to print it.

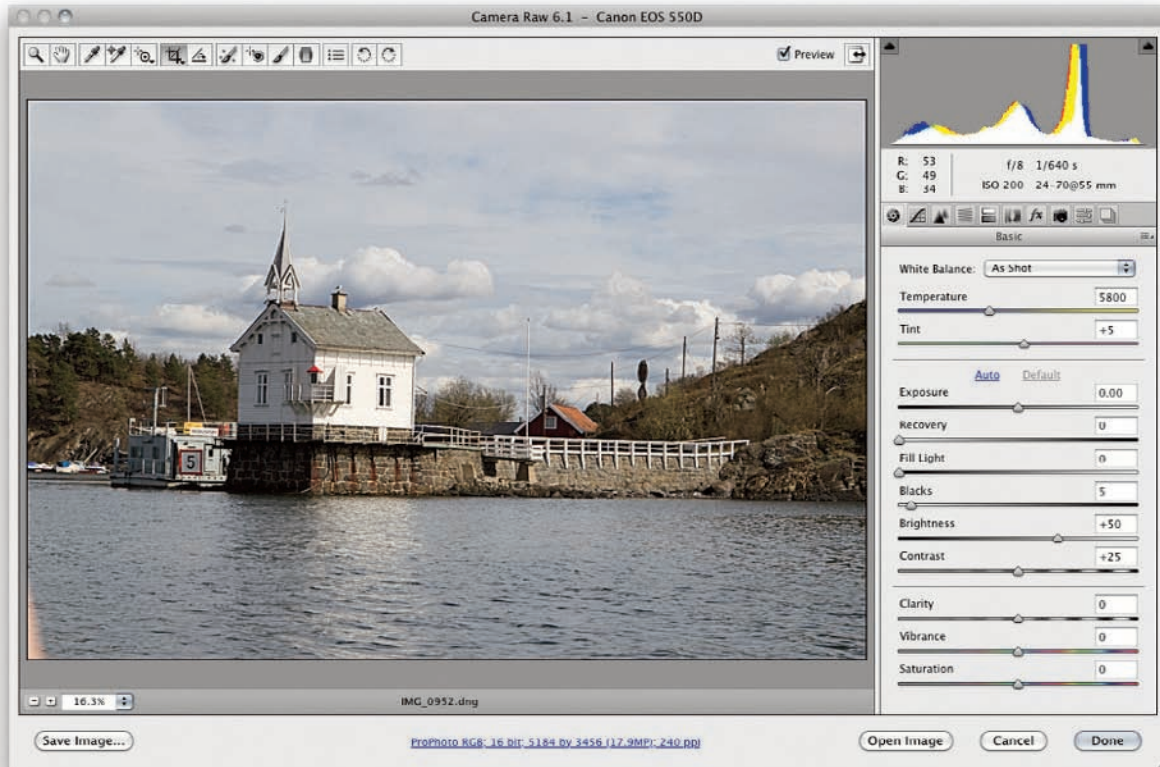


Figure 2.14 This shows the uncropped before version using the default Basic panel settings.

Auto Lens corrections

This is a new CS5 feature that is only available providing you have installed the free Camera Raw 6.1 update. Once installed you will find that most popular camera lenses for digital SLR camera systems are supported. Simply checking the Enable Lens Profile Correction option applies an instant auto lens correction to the image. In Figure 2.15 I began by applying an auto lens correction to the photo I was about to edit. In this instance the lens data was recognized and the default setting corrected the geometric distortion, chromatic aberration and lens vignetting. This is a useful correction to apply to all photos you are about to edit since it optimizes the capture data to give you the most optically correct image possible. Having said that, the default lens profile corrections may not always provide the best match for your lens, so follow the advice in the sidebar for customizing this adjustment.

Customizing Lens Profile corrections

A default Lens Profile correction may not always apply an optimum correction adjustment. This is because all lenses can vary slightly. Therefore, you can use the sliders at the bottom to fine-tune the Lens Profile correction to match the characteristics of your lens and then go to the Setup menu and choose Save New Lens Profile Defaults. This will now be the new default setting that's applied the next time this lens is recognized.

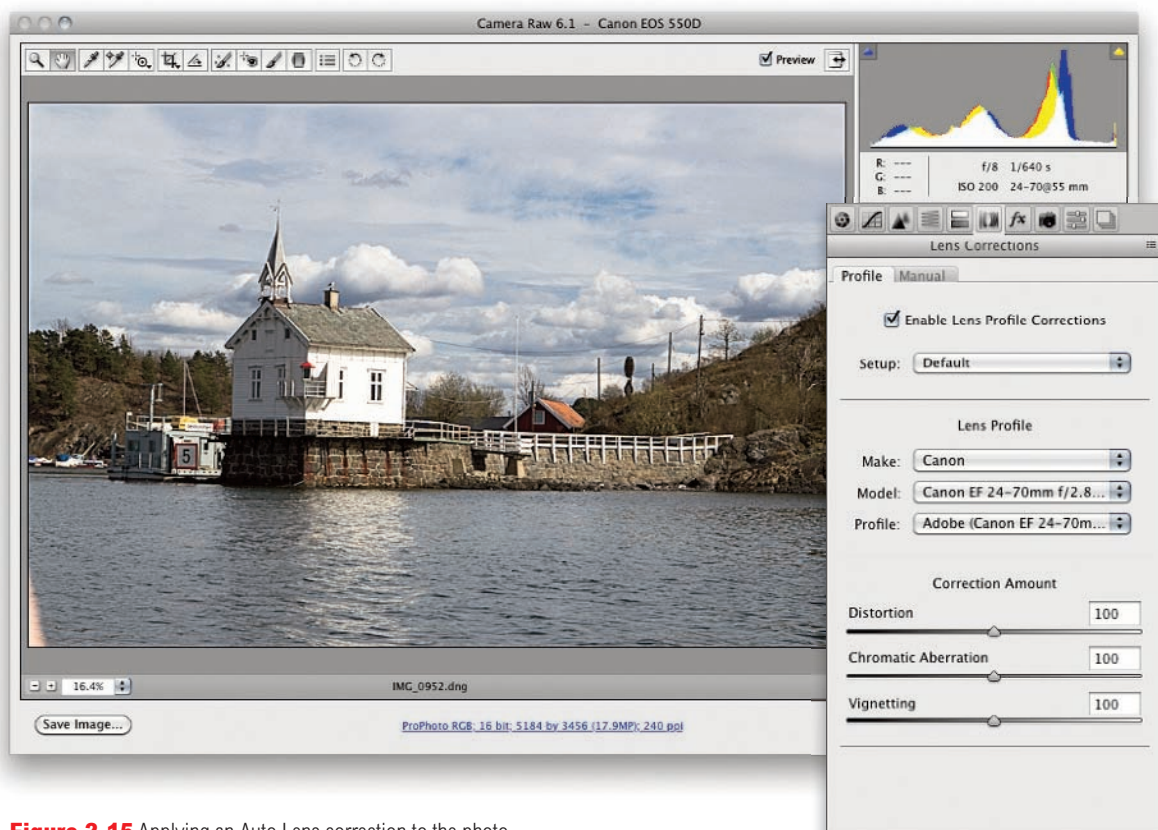


Figure 2.15 Applying an Auto Lens correction to the photo.

Crop

When you work in Camera Raw, there is no particular order that you must follow. That's the beauty of Camera Raw, it's a non-destructive process and you can undo and redo the adjustments as many times as you like. You can start with the tone and color editing and end with a crop, although I reckon it is always best to carry out the tone and color editing first before you decide how to capture sharpen. I simply suggest you crop the photograph first because once you have cropped an image you get a better feel for how the final image can look before you make the tone and color adjustments. It doesn't matter if you crop last, but generally you'll find the crop can sometimes change the whole feel of an image and you may end up having to revise your earlier adjustment settings.

In Figure 2.16 I cropped the photograph more tightly to remove a blurred object in the bottom left corner (but preserved the same 2:3 aspect ratio) and rotated the crop slightly so the cropped photo was more level with the horizon.

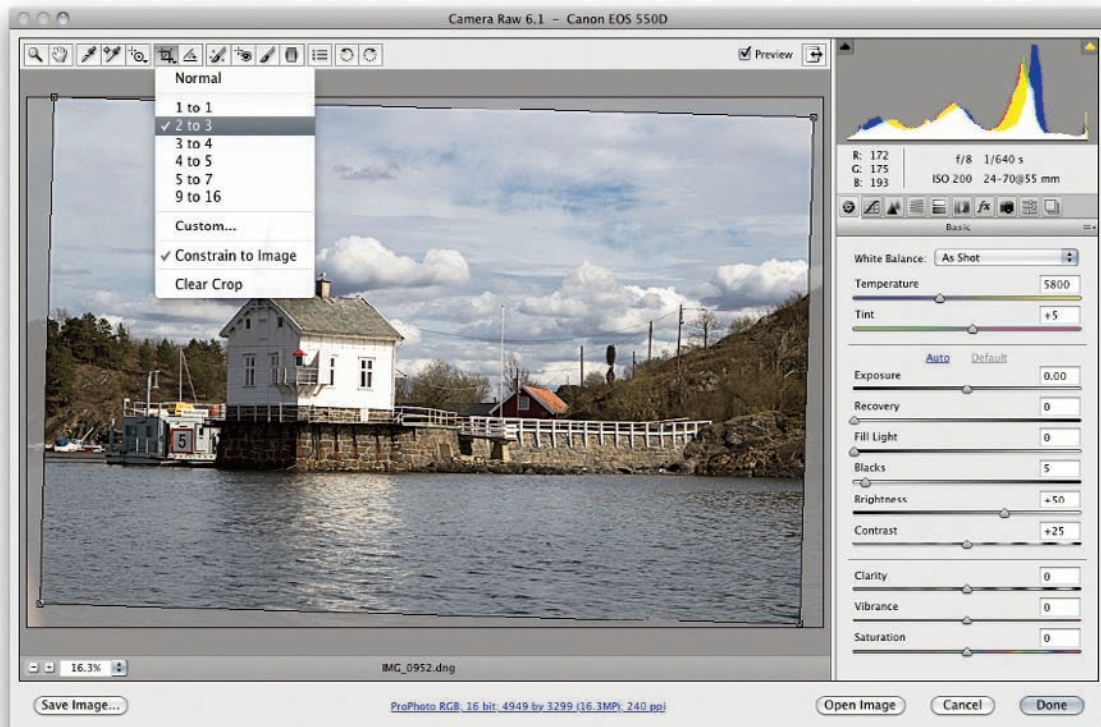


Figure 2.16 Cropping the image.

Color

Next, we come to the color adjustment stage. The white balance controls are placed first at the top of the list of Basic controls, so we'll start here. This photograph was shot with the camera using an auto white balance setting. The As Shot white balance didn't look too bad, but by dragging the Temperature slider to the right I was able to apply a warmer white balance setting for the whole photograph (see Figure 2.17). That's just one way you can do this. Other methods include selecting a preset white balance setting from the Color Temperature menu, or choosing the Auto option to let Camera Raw work out the optimum setting. Usually, once you have got the white balance right, most of the other colors in the scene will fall into place.

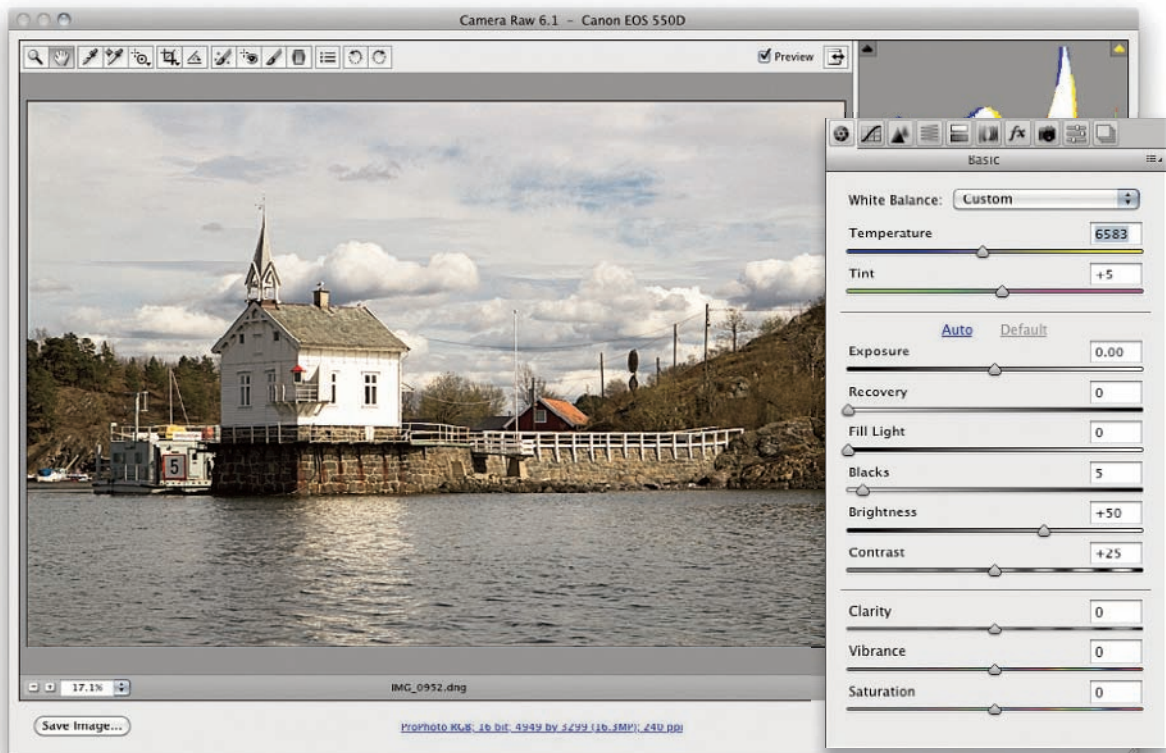


Figure 2.17 Setting the white balance.

Tone

I was now ready to tone adjust the image. There are four main sliders that you can use here: Exposure, Recovery, Fill Light and Blacks.

Exposure

I recommend that you start with the Exposure slider and use this to gauge how much you wish to lighten or darken the picture. The one rule we would apply here is to always adjust the Exposure before you adjust the Brightness (which I'll come onto shortly). In Figure 2.18 you can see an Exposure adjustment being applied. As you adjust the Exposure you can also use the Histogram to be your guide to make sure that you don't push the Exposure slider so far that you clip the highlights. You can also use the highlight clip warning here, or hold down the **alt** key as you drag the Exposure slider and check the appearance of the Threshold preview shown on the screen.

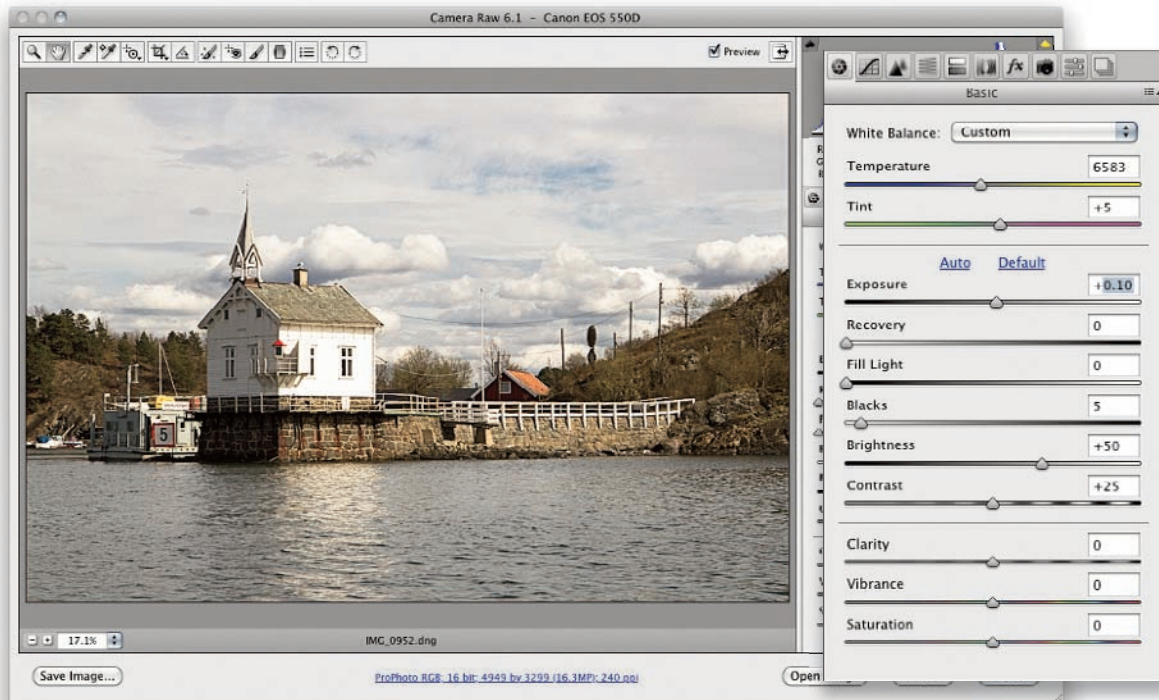


Figure 2.18 Setting the overall Exposure and highlight clipping point.

Recovery

The next step is to make sure that there is no significant clipping in important areas of highlight detail. This is something that was touched on earlier in the Optimizing the image tones section. When it comes to making Camera Raw adjustments the best advice is to use the Exposure slider first to adjust the overall brightness. As you do so, you will want to check the appearance of the extreme highlight detail as well as the RGB numbers to make sure these don't go too high. Quite often you'll find that as you set the Exposure, you can get both the brightness and highlight clipping right in one go. However, you shouldn't have to restrict an Exposure adjustment, because the Recovery slider can be used to preserve detail in the highlights, but without altering the effect of the Exposure adjustment (see Figure 2.19). So basically, you should adjust Exposure to expand the tones, making the image brighter or darker. Where you see signs of highlight detail clipping, you can use the Recovery slider to bring back more highlight detail.

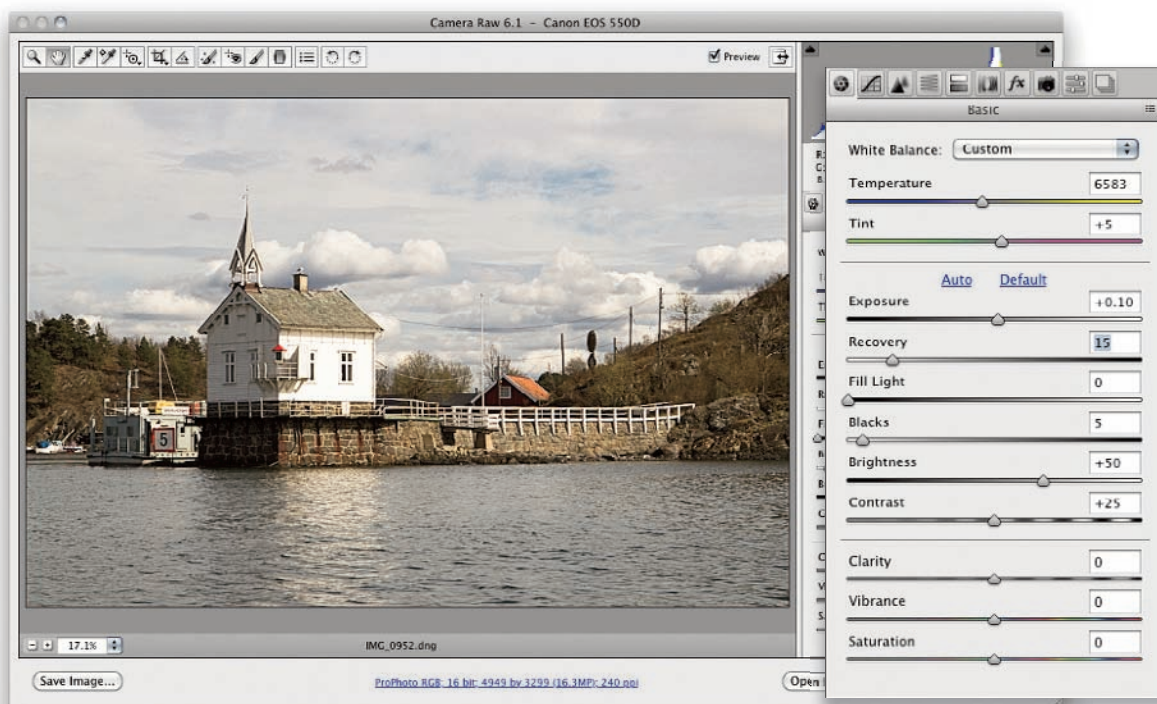


Figure 2.19 Adjusting the Recovery slider to protect highlight details from clipping.

Blacks

I'll skip the Fill Light slider and look at setting the Blacks next. If you refer to the section earlier on setting the black clipping point, you will recall how we advise you to simply clip the blackest blacks in the picture as you see fit. There is no need to concern yourself with setting the output levels for the black point, since this can all be handled automatically in Photoshop when you send a file to print or make a CMYK conversion.

Because of the way Camera Raw calculates its tone adjustments, small incremental Blacks adjustments produce a much more noticeable shift in tone adjustment compared to corresponding Exposure adjustments. The default Blacks setting in Camera Raw is 5, which is usually about right for a lot of photographs, and our advice is to not take the Blacks slider any lower than 2 or 3. Or, you can increase the Blacks clipping if you feel it would be useful to hide some of the shadow detail and make these tones all clip to solid black. In the Figure 2.20 example, I raised the Blacks clipping point to 10.

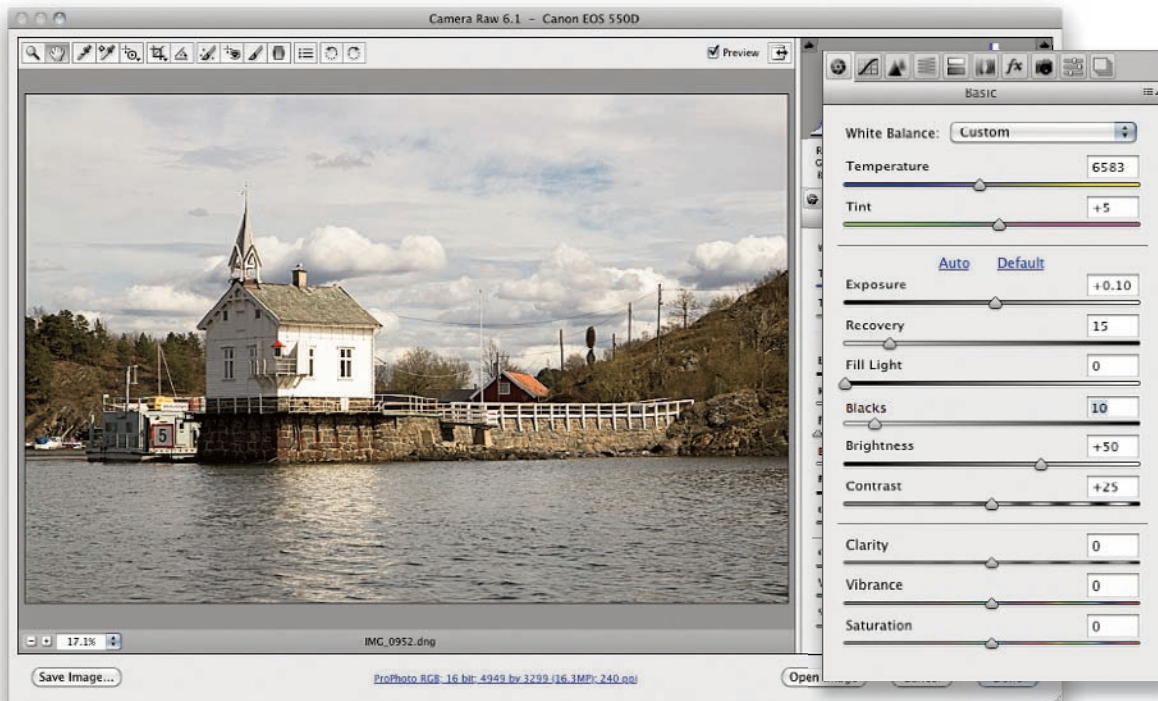


Figure 2.20 Setting the Blacks clipping point.

Fill Light

It is usually best to add Fill Light after having set the Blacks. Fill Light can be used to lighten the shadows and reveal more detail. As with Recovery, it's not necessary for every picture, but for this example I added +25 Fill Light.

Brightness

As I mentioned earlier, you should always adjust the Exposure before you adjust the Brightness. In the steps shown so far, I used the Exposure and Recovery to expand the tones in the photograph and fine-tune to avoid clipping. In the Figure 2.21 step you'll notice how the Brightness adjustment was applied last to adjust the 'relative brightness' of the photograph. In this instance, the Brightness adjustment had little effect on the highlight clipping, but essentially it made the midtones darker. You can therefore think of the Brightness slider as behaving just like the Gamma slider in the Photoshop Levels image adjustment.

Don't overdo Fill Light

The Fill Light adjustment can work wonders at lightening the shadow areas while preserving the black clipping point. Take care not to overdo things with the Fill Light adjustment, because if you add too much Fill Light you can get unnatural looking shadows (it is worth checking these in close-up when adding a lot of Fill Light). If you need to dramatically lighten the shadows, it is better to use Tone Curve adjustments in conjunction with Fill Light. Having said this, I should point out that the Fill Light algorithm in Camera Raw 6 is much improved, such that extreme Fill Light adjustments will produce much better looking results.

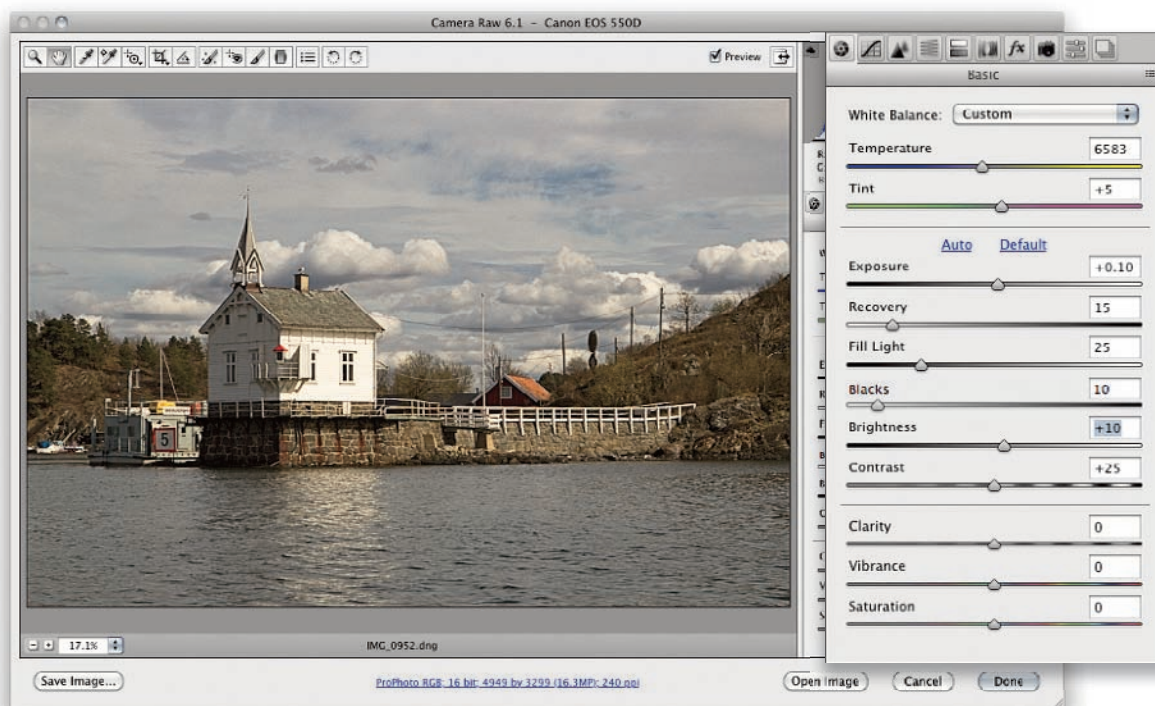


Figure 2.21 Setting the Fill Light and Brightness.

Contrast

The steps applied so far all affect the image's global contrast and the Exposure and Blacks sliders in particular have the greatest effect here. The Contrast slider in the Basic panel can therefore be used at this stage to further modify the contrast. Basically, after you have set the highlights and blacks and adjusted the brightness, what do you think of the image? Does it look too flat at this stage or too contrasty? The Contrast slider provides a simple, yet effective means to adjust the global contrast. In the Figure 2.22 example I reckoned the photograph could have done with some added contrast. The default setting is +25, but here I chose to raise this to +50.

Of course, you can also go to the Camera Raw Tone Curve panel and adjust the contrast. While we both like using the Tone Curve there is a lot to be said for the simplicity of the Contrast slider. You don't have to switch panels to carry on editing the image and a simple slider adjustment is often all you need to get the contrast looking right at this stage.

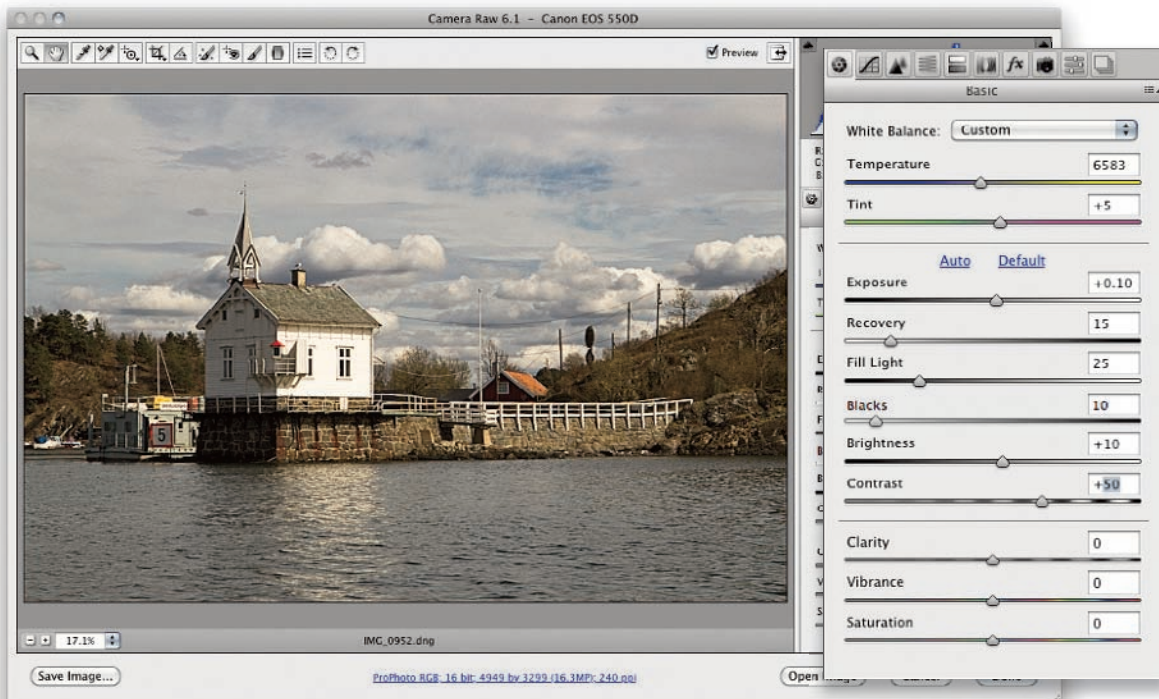


Figure 2.22 Setting the Contrast.

Finesse

This step is about adding polish to the image. It's not obligatory, but something that we both do to quite a number of our images. You could include in this step things like HSL panel adjustments to selectively lighten or darken certain colors. Here, I wanted to keep this section simple, so we'll focus on just the Clarity and Vibrance sliders in the Basic panel.

Clarity

The Clarity slider provides a nice, easy to use adjustment for adding midtone contrast to an image. A little later on in this book in Chapter 3 we'll be showing two different Photoshop techniques that can be used to add variable midtone contrast. The Clarity slider combines a bit of both of these techniques and is an effective tool for enhancing detail contrast (as opposed to sharpness) in areas of flat tone. Most photographs can benefit from adding at least +10 Clarity; in the Figure 2.23 example I set the Clarity to +15.

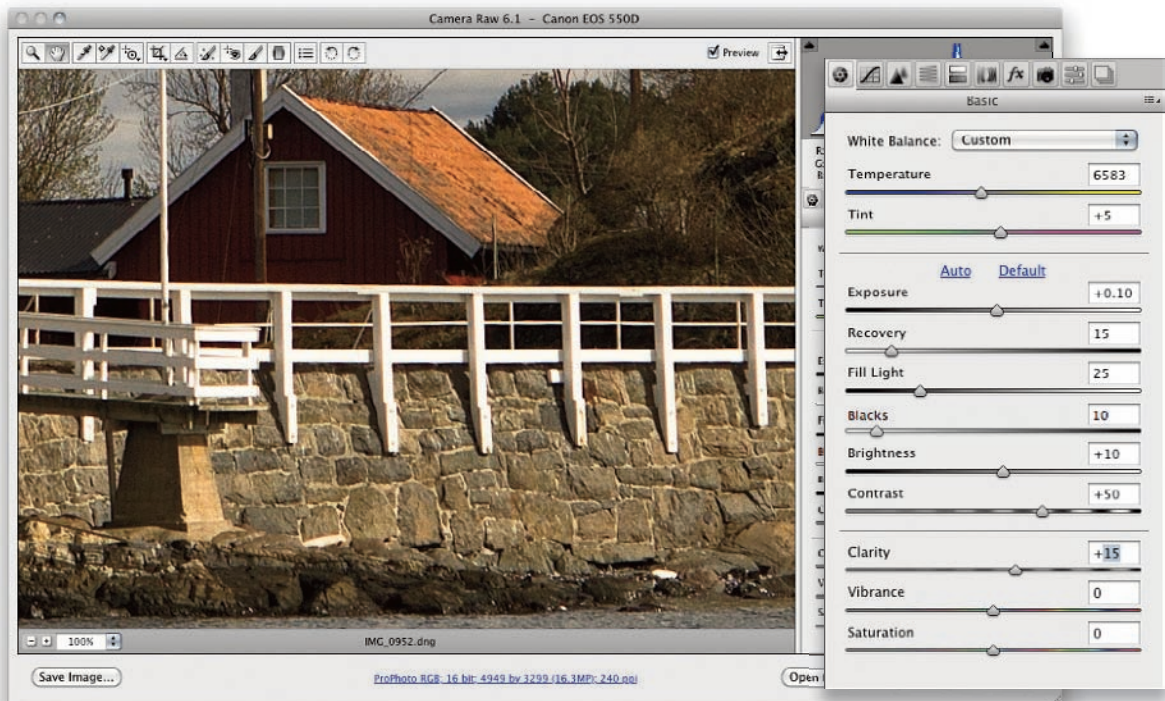


Figure 2.23 The Clarity adjustment step.

Vibrance

Just below Clarity we have the Vibrance and Saturation sliders. Saturation has been around since version 1 of Camera Raw and provides a basic method for boosting saturation in a photograph as it applies a 'linear' type saturation adjustment to the image. This means that it boosts the saturation of all colors evenly, including those colors that are already quite saturated. The downside of this is that it is very easy to clip some of the already saturated colors when applying even a modest saturation boost. The Vibrance control, on the other hand, applies a non-linear saturation adjustment in which the least saturated colors get the biggest boost, while the already saturated colors receive less of a boost. Vibrance also tends to filter out skin tone colors so that these are more protected as you increase the Vibrance. In Figure 2.24 I applied a +30 Vibrance. This enriched the colors in the scene, but without clipping the richer colors.

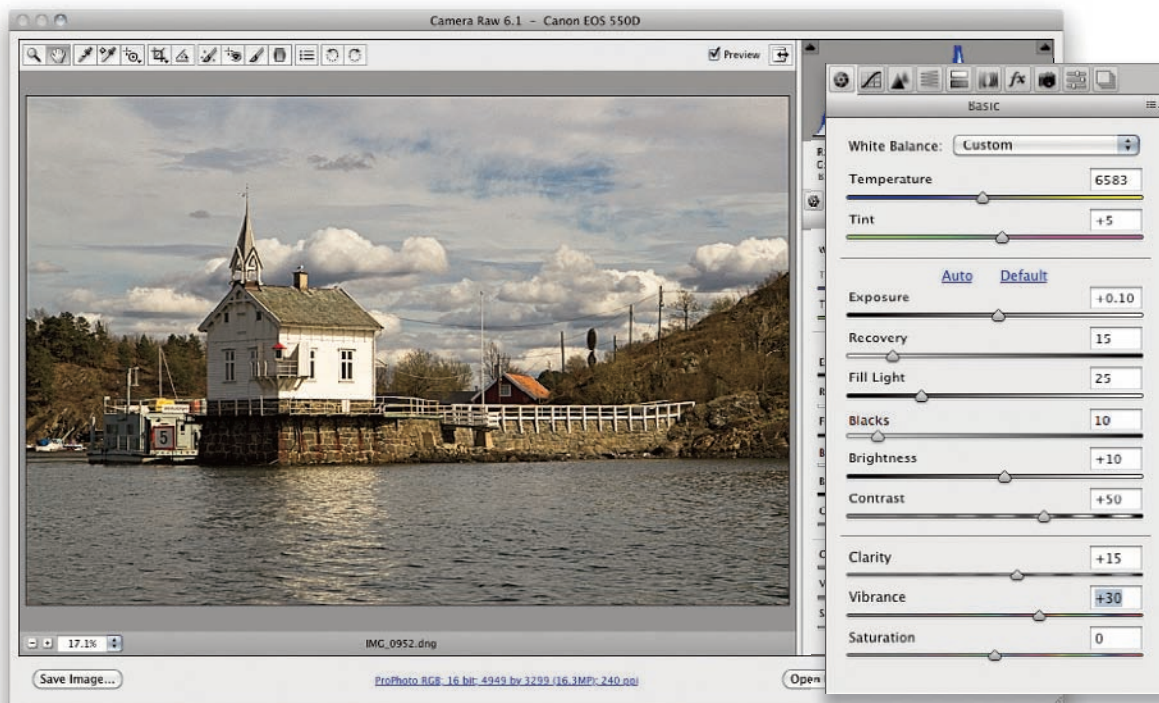


Figure 2.24 The Vibrance adjustment step.

Capture sharpening

Finally, we come to the capture sharpening step, where I went to the Detail panel in Camera Raw and fine-tuned the four Sharpening sliders according to the sharpening needs of the image. When you first go to the Detail panel you'll see default settings of 25 Amount, 1.0 Radius, 25 Detail and 0 Masking. These offer a reasonable starting point for most images, so even if you do nothing here, Camera Raw still applies some capture sharpening.

Amount and Radius

The Amount and Radius need to be adjusted in tandem. The Amount determines how much sharpening is applied, while the Radius lets you decide how wide you want the halo edges to be. Basically, a Radius of 1.0 works well for most edges. Fine detailed subjects will benefit from a smaller Radius setting and soft detailed subjects such as portraits can do with using a wider radius of, say, 1.1–1.3. In the Figure 2.25 example I applied an Amount of 39 combined with a low Radius setting of 0.8 pixels.

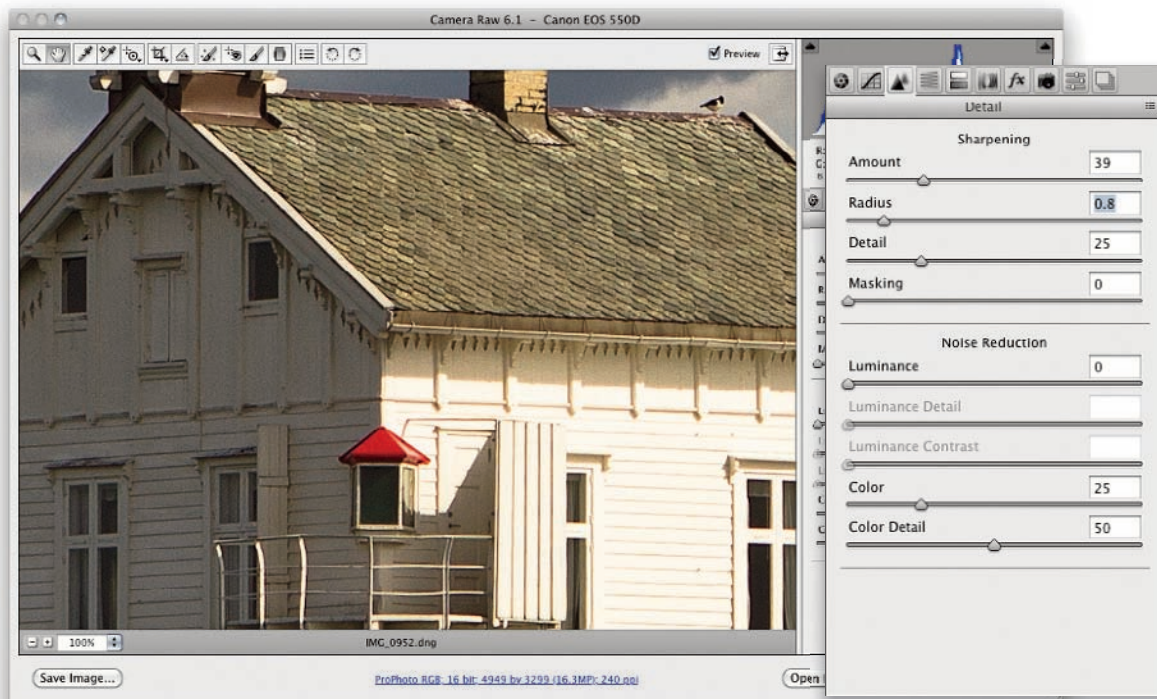


Figure 2.25 The Amount and Radius sharpening step.

Sharpen for content

It is important to adjust the capture sharpening for the needs of the individual image. Once you have got the capture sharpening tailored to the requirements of each photo, the output sharpening that is applied at the end will be the same for every image.

Maximum detail

If Detail is set at 100, the sharpening effect is similar to that achieved when using the Unsharp Mask filter in Photoshop.

Detail and Masking

The Detail and Masking sliders act like suppression controls for the sharpening. Setting the Detail slider to an amount lower than 100 allows you to suppress the halo artifacts. With soft detailed subjects (such as portrait photographs) it is preferable to use a low Detail setting. With detailed photographs such as this, it was OK to increase the Detail setting and not suppress the halos quite so much, which allowed me to apply a stronger sharpening effect. The Masking slider can be used to apply a mask based on the image content that filters the capture sharpening effect. With detailed subjects we leave the Masking set to zero, but for other types of image it is worth raising the masking, as this can help protect some of the soft detailed areas from being over-sharpened. In Figure 2.26 I applied a Detail of 35 and set the Masking to 15.

Noise reduction

The noise reduction can now be applied using the three Luminance sliders (Luminance, Luminance Detail and Luminance Contrast) to

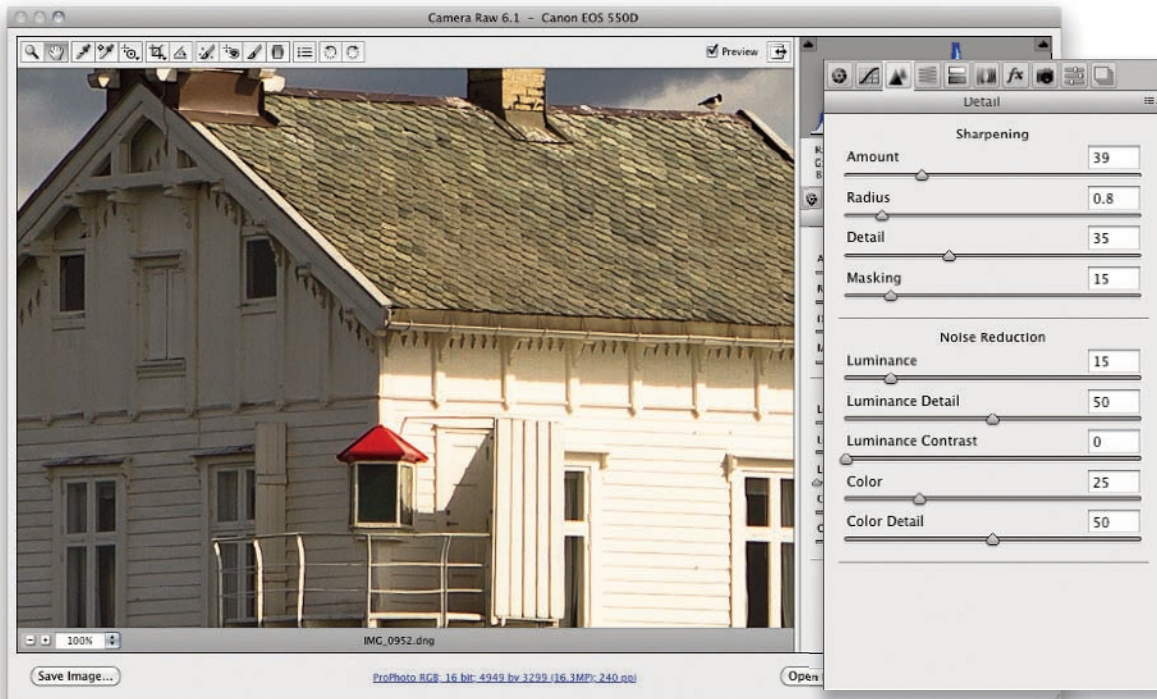


Figure 2.26 The Detail sharpening step.

suppress the grain-like effects of camera noise. The Color and Color Detail slider can be used to suppress the color speckle artifacts that are also a consequence of high ISO capture with some digital cameras. For most low to medium ISO captures I tend to stick with the default settings, but for high ISO captures, where more noise is usually visible, I tend to adjust the Color sliders first to remove the color speckles and then see if it is necessary to adjust the Luminance sliders to smooth out noise artifacts. We'll be looking at the new noise reduction controls in more detail in Chapter 3.

Localized adjustments

Next, I applied a few localized adjustments (see Figure 2.27). As you can see here, I selected the graduated filter tool and added a couple of graduated adjustments. I applied a darkening adjustment to the water and then added a further darkening adjustment to the sky, where I also applied a light blue color to make the sky appear slightly more blue.

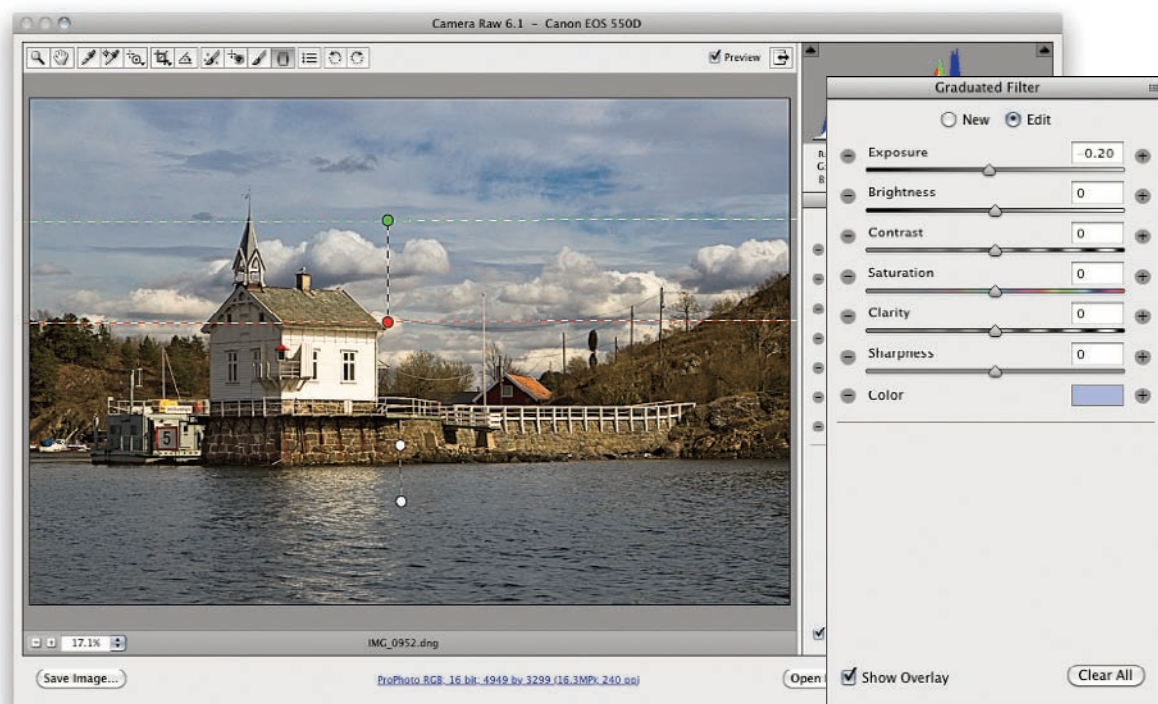


Figure 2.27 Applying localized adjustments.

Spotting

The spotting can be done using the spot removal tool (as shown in Figure 2.28). Of course, you can apply this step at any time, but it is something that I usually prefer to do last. The reason for this is that all the preceding steps can be applied quickly and the settings easily shared across multiple images. I generally only want to go to the bother of spotting an image if I am really sure that I want to use it. While it is possible to share spot removal settings across multiple selected photos you have to be careful to make sure that the shared spot removal settings work OK on each individual image. Another thing to bear in mind is that some blemish sensor marks will only show up after you have adjusted all the tone settings, so you can see the problem more clearly if you do the spotting at the end rather than at the beginning.

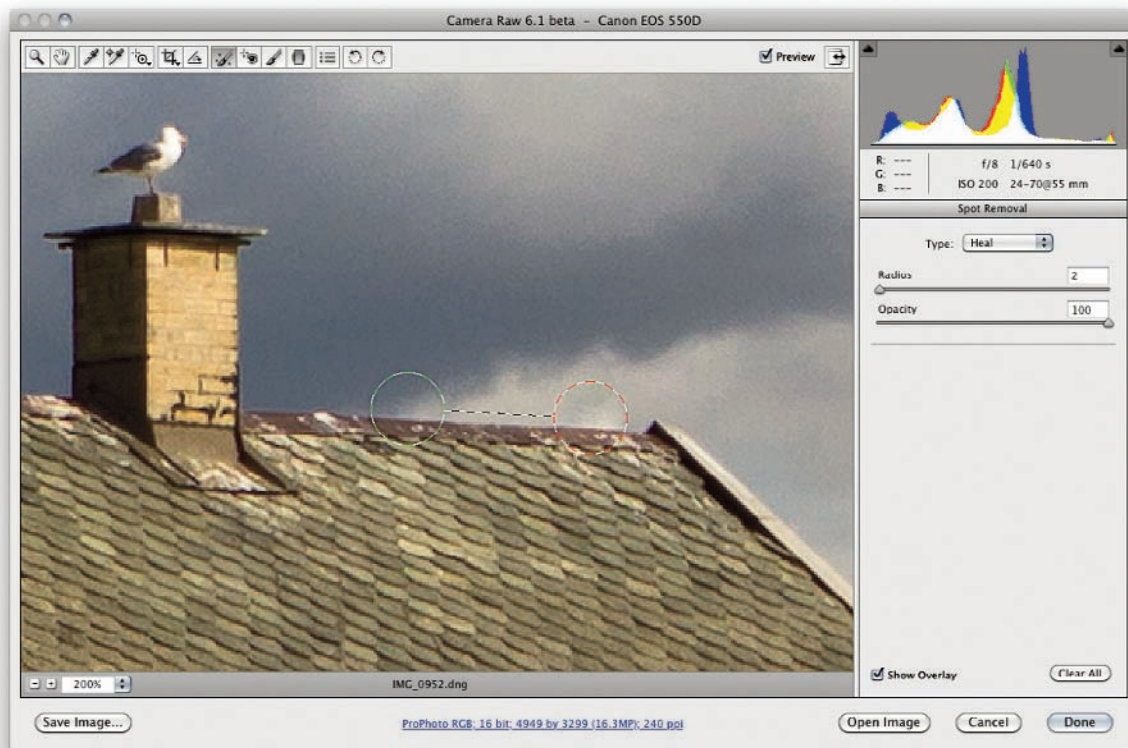


Figure 2.28 This shows an example of the spot removal tool being used to spot the image. It so happened with this image that there were no sensor marks that needed to be removed. So here I used the spot removal tool to remove a bird from the roof of the building instead.

An overview of the Camera Raw workflow

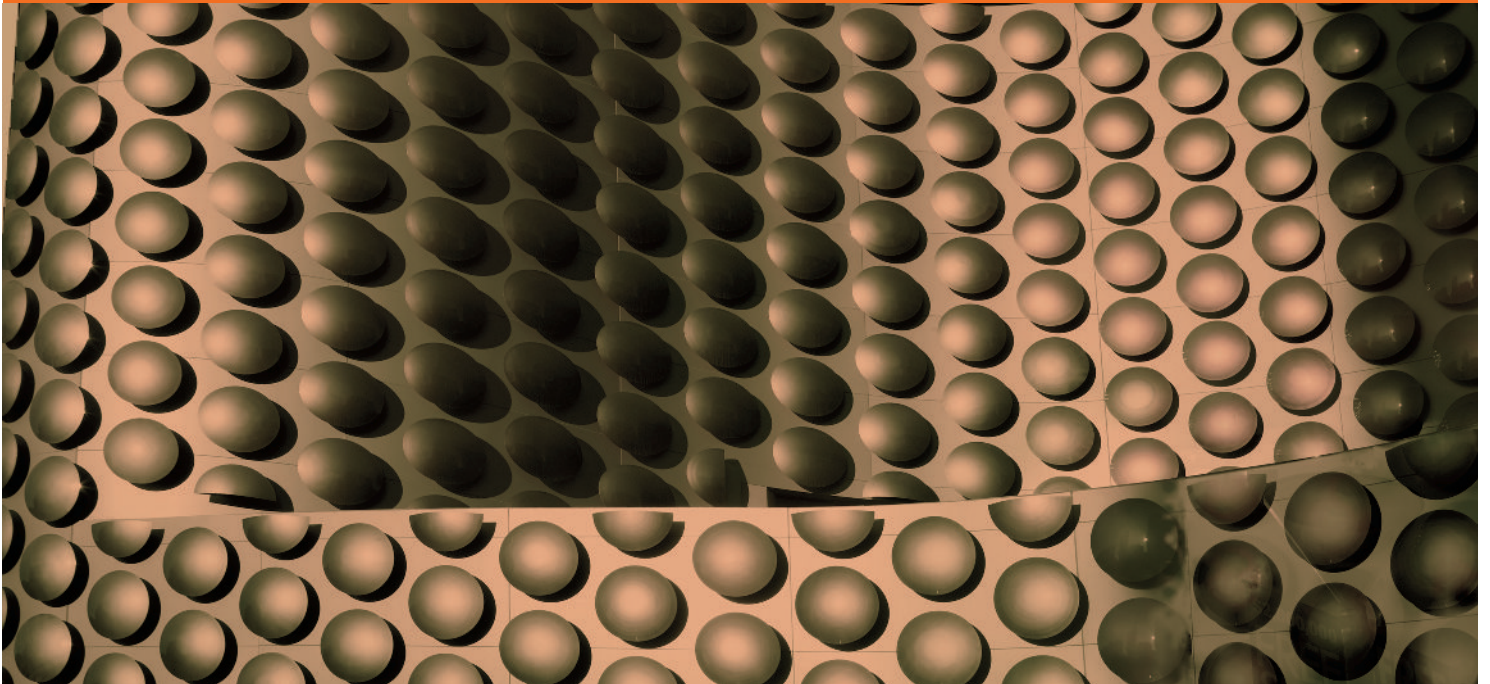
The purpose of this chapter is to put the Camera Raw workflow into perspective and show how most of the image editing work can be done at the Camera Raw editing stage. While it is possible to repeat much of what is shown here using Photoshop image adjustment tools like Levels, Curves and Shadows/Highlights, why would you want to do that? Camera Raw allows you do just about everything you want, including the all-important capture sharpening and noise reduction non-destructively, before you take your photos into Photoshop. Figure 2.29 below compares the finished photograph with the version we started out with.



Figure 2.29 Here you can compare the before version (top) and the edited version below.



Photograph: Jeff Schewe.
Canon EOS 1Ds Mk III Camera | 24–70 mm lens at 40 mm | 200 ISO



Chapter 3

Raising your IQ

How to improve your image quality

We naturally all want our photographs to look their very best when they are printed on the page. In this chapter we wanted to start by looking at some of the ways you can help guarantee getting the best digital results from your camera. We have therefore chosen to concentrate here on how to get the best from your camera lens optics, some shooting techniques to improve image quality as well as post-processing tricks that can be done in Photoshop.



Figure 3.1 Martin on location in Capitol Reef National Park using a tripod to maximize image quality.

Improving camera capture sharpness

It is all very well using image sharpening to improve image detail, but it's also important to ensure that the images you capture are as sharp as they can be – before processing the images in software.

Choice of camera lens

The most obvious factor that affects sharpness will be the quality of the image optics used on the camera. In the past, camera lenses were designed to meet the specific needs of film. This is not to say that film-designed lenses are no longer any good. Many of the classic lenses are indeed well suited for digital photography, but there are certain limitations you need to be aware of. First of all, the lenses for 35 mm film cameras were designed to resolve well enough so as to capture a sharp image on a 24 mm × 36 mm area of film emulsion. Even when using the finest grain film emulsion processed under ideal conditions, the ultimate resolving power of 35 mm film cannot even begin to compare to the amount of detail that can be captured by the sensors found in some of today's digital SLR cameras. So, lenses that might have been great or OK 10 years ago are not going to allow you to get the most out of the resolving power of, say, a 16 or 22 megapixel camera. Even if you use a good quality zoom lens, there may not be any point capturing anything more than 16 megapixels of data. However, if you use a modern prime lens, you should certainly see a definite improvement in capture sharpness. At the end of the day, 11 megapixels of data captured on an average zoom lens is plenty of pixels for most reproduction quality work, but if you need extra detail, and want to make the most of what the sensor can offer, then you do need to think carefully about the lenses you shoot with.

Another consideration is the fact that film lenses were designed to resolve a color image to three separate (red, green and blue sensitive) film emulsion layers which overlaid each other. Consequently, film lenses were designed to focus the red, green and blue wavelengths at fractionally different distances and at even further distances apart towards the corner edges of the film emulsion area. Since the red, green and blue photosites are all in the same plane of focus on a digital sensor, lenses that are specifically designed for digital capture should now focus the red, green and blue wavelengths to a single plane of focus.

Shooting with a tripod vs. hand-held

There are some obvious benefits to shooting with the camera fixed to a tripod, especially when shooting in low light conditions where you would otherwise be forced to use a slower shutter speed or higher ISO setting. Figure 3.1 shows Martin using a tripod on location in Utah. One thing you do have to be careful of is to not use image stabilization when shooting on a tripod since with some older lenses, the image stabilization can actually end up destabilizing the image.

Improved sharpness using mirror-up mode

The action of the mirror flipping up on a digital SLR or medium format camera causes a small amount of internal vibration. This can be a problem when shooting with continuous light and where the time duration in which the camera body vibrates slightly makes up a significant proportion of the overall exposure. We therefore reckon this is more of an issue when using shutter speeds of around, say, 1/15th to 1/125th of a second and when photographing close-up subjects, as opposed to landscape scenes shot with a wide-angle lens (see Figures 3.2 and 3.3). We reached this conclusion after conducting tests on a series of shots, including the examples shown in Figure 3.3, where we found that the mirror vibration effect was most noticeable at around 1/60th of a second. Ironically, the problem can be made worse when the camera is mounted on a tripod. This is because the vibration movement originates within the camera itself and when the camera is supported on a free-standing tripod, such vibrations are unconstrained. When you hand-hold a camera the mirror vibration can be absorbed through your hands. You could say that the photographer holding the camera is acting like a giant shock absorber!

When we shoot non-moving exterior shots on a tripod or studio subjects lit with continuous lighting, we often use the camera in mirror-up mode when shooting close-up details. This can be tricky with some cameras, as it is often a custom user setting that is buried deep in the camera settings menus. One of the nice features of the latest Canon EOS cameras is that it is now much easier to set up the mirror-up mode as a favorite camera setting that can be accessed more easily when you are out shooting on location.

Image stabilizing lenses

Image stabilization can be achieved in two main ways. Image stabilizing lenses use gyroscopic motors to move the lens elements in an effort to keep the image steady. If you look through the camera and move the lens about quickly, you'll hear the motors whirring as they compensate for camera shake type movement and you'll sometimes notice how the image jumps every now and then as you do so. Some cameras can stabilize the image by using motors to move the sensor instead and the advantage of this is that you are not limited to working with specific image stabilizing lenses only. In either case, image stabilization can help you shoot sharp pictures at slower shutter speeds and this can effectively buy you a couple stops of exposure, where without image stabilization you would be forced to shoot at a higher ISO setting in order to get sharp pictures.



Figure 3.2 This shows a close-up view of a detailed subject where the top picture was shot with the mirror-up option switched off and the bottom picture was shot with the mirror-up option switched on. Canon EOS 1Ds MkIII with a Canon EF 100 mm f2.8 Macro lens, shot at 1/60th, f 7.1, 200 ISO.



Figure 3.3 This shows the same subject that was shot in Figure 3.2, this time showing the difference between four methods of shooting, using the Canon EOS 1Ds MkIII at a 200 ISO setting with an exposure of 1/60th second at f7.1. The top left example was shot on a tripod using an EF 70–200 mm lens in mirror-up mode. Next to it, on the right, is a hand-held version shot with the lens image stabilization switched on and, bottom left, a shot taken with the image stabilization switched off. The bottom right picture shows the same subject photographed on a tripod, but with a less expensive Canon zoom lens.

Megapixel limits

Each year we see the bar raised as to the number of megapixels digital cameras can capture. There is, of course, a strong marketing drive for manufacturers to claim that their cameras can capture more megapixels than the competition, as this still remains a strong influencing factor in most digital camera purchase decisions. After all, having more megapixels must mean bigger, better pictures, right? Or does it?

How far can we keep going?

Many people have assumed that digital cameras will just keep having more megapixels. But surely there comes a point where it isn't possible to squeeze any more photosites onto a sensor? The main limitation here is that as the photosites on a sensor are made smaller, the physical number of photons that can hit each photosite diminishes accordingly. With a 21–24 megapixel full-frame 35 mm sensor, the number of photons resolved per pixel can be calculated as being as low as 6 for the darkest shadows. Photon detection is also random and the signal to noise ratio increases as there are fewer photons to record. This highlights another physical constraint and that is how well a sensor can resolve shadow detail as you attempt to squeeze more photosites into the same fixed frame size. In a paper by David B. Goldstein, *Physical Limits in Digital Photography*, published on the Northlight Images website (<http://tinyurl.com/kqbett>), Goldstein has taken into account the limits of shadow detail recording with small-sized photosites as well as the limits of current lens optics. He has suggested that in the case of full-frame digital SLRs, 25–35 megapixels is the current practical limit. This is based on research using the best quality lenses at an optimum lens aperture of $f/10$. Until there is some breakthrough in lens design that offers better performance at wider apertures, then this will be the physical limit.

The limits of lens optics

It should be self-evident that the image you capture can only be as good as the optics used to focus the image in the first place. It is no good having a 22 megapixel full-frame sensor unless the glass on the front of the camera is capable of resolving a picture that is sharp enough to make full use of those extra megapixels. Not only that, but you have to bear in mind that the optimum resolving

power of a lens used with a full-frame digital SLR camera is probably somewhere around $f/8$. At the widest apertures you are more likely to experience a lens performance drop-off towards the edges of the frame. At lens apertures that are wider than, say, $f/5.6$ or $f/8$, the lens performance usually diminishes due to the limits of the lens optics' ability to resolve a fully sharp image evenly from the center to the edges of the frame. Obviously, there are some ultra-wide aperture prime lenses which can be expected to outpace other lenses at the widest aperture settings, but these too tend to perform better as the lens aperture is stopped down more.

All lenses will have an optimum aperture setting at which the lens performs at its best, and as you stop down and make the aperture smaller these benefits are limited by the effects of diffraction, which diminishes the effective sharpness of a lens. Basically, as the aperture is made smaller this causes the light waves to diffract and this leads to a softer contrast image containing less detail. The effects of diffraction are also linked to the physical size of the sensor. The diffraction limit for lenses used with full-frame digital SLR cameras is around $f/10$. With smaller compact digital SLR cameras, because the sensor is that much smaller, the diffraction effects start to become more noticeable at lens apertures of around $f/7$ or $f/8$.

We should also consider the implications for smaller format, compact digital cameras. According to Goldstein, with consumer digital cameras, the size of the sensor is so small that the diffraction effects can become noticeable at around $f/2.4$, and he points out that there is so far only one compact camera that allows you to shoot at an aperture as wide as that. As you stop the lens down the resolving capability at the smallest aperture decreases to just a few megapixels. So, with one of the latest 12 MP compact cameras, you are probably only going to be able to fully appreciate the benefit of all those megapixels if you can shoot using the widest lens aperture available. Therefore, in the case of compact digital cameras we have probably already reached the limit at 12 megapixels.

To sum up: the main limiting factors for lens optics performance are the ability to focus an image evenly from the center of the field to the edges, at the widest aperture, and the effects of diffraction at the smaller apertures. The optimum lens aperture therefore lies between these two extremes and the effects of diffraction are also affected by

Lens diffraction

As you stop down a lens and use a smaller lens aperture, you gain the benefit of increasing the depth of field, thereby improving the apparent sharpness of an image. However, as the lens aperture becomes smaller in size you need also to be aware of the effects of lens diffraction. This is due to the way light, which normally travels in straight lines through air, disperses when it travels through a small hole, such as the aperture of a lens. This effect is barely noticeable at the wider lens apertures but becomes more noticeable as the lens aperture is made smaller.

the ultimate resolving power of a camera's sensor at a given frame size. Figure 3.4 shows an example of a lens test report for a Canon 28–135 mm zoom lens shot using a Canon EOS 40D and Figure 3.5 below it shows actual examples of lens performance using this same lens, shot at the widest, optimum and minimum apertures, but using the Canon EOS 1Ds MkIII. As you can see, the photographs bear out the results shown in Figure 3.4. The widest aperture version is not as optically sharp as the f/5.6 example and the smallest aperture version suffers from fuzziness and a lack of contrast.

We are close approaching the limits imposed by the laws of physics as to how many megapixels can be achieved from full-frame digital SLR cameras or smaller. It seems to us that the only way forward now if you wish to achieve better image quality is to invest in a larger format camera system. It is therefore interesting to note that digital camera systems such as the Hasselblad H series, or the Phase One P65, that Jeff shoots with, are actually not that much bulkier than a full-frame Canon or Nikon digital SLR, but can offer better image quality through recording a higher number of megapixels from a sensor that is physically bigger than a standard 24 mm × 36 mm full-frame digital SLR. The same holds true for the latest Leica S2 system, which uses a 30 mm × 45 mm sensor. However, Goldstein points out that with bigger format camera systems you often need to stop down more to achieve a comparable depth of field to that of a smaller format camera system. So if matching depth of field capability is important, the trade-off is that you don't necessarily gain as much extra resolving power as you might expect.

One photographer's viewpoint

Based on my own experience, once digital SLRs were able to capture more than 10 megapixels, I found this was plenty of pixels to work with for most purposes. I have large A1-size framed landscape prints on the walls in my house that were shot using the Canon EOS 1Ds MkI, which was my first proper 11 megapixel digital SLR camera (see Figure 3.6). The fact that more recent versions of this camera are able to capture more megapixels is great. However, in order to fully appreciate the benefits of such high pixel capture resolutions it has been necessary for me to shoot using better quality optics, such as prime lenses and at optimum lens aperture settings.

Canon EF 28-135mm f/3.5-5.6 IS USM on Canon EOS 40D body Variation of MTF50 with Aperture Setting

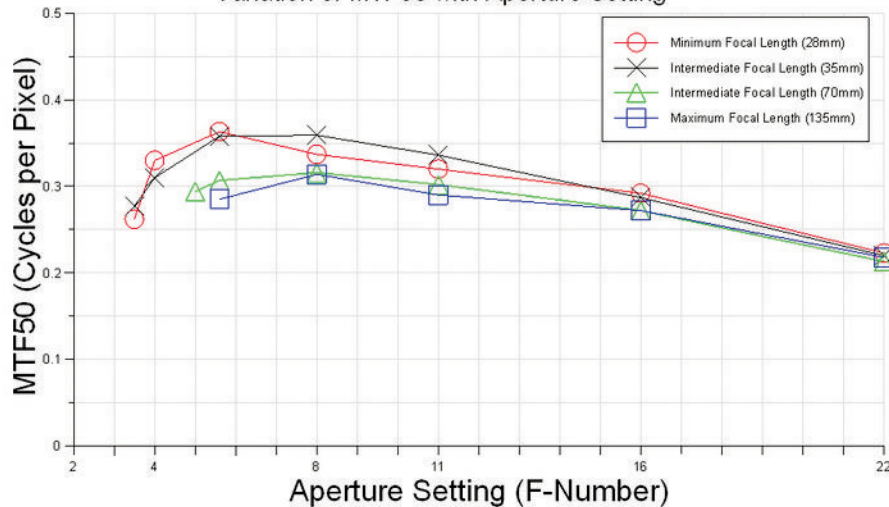


Figure 3.4 This lens test chart shows a typical lens response from the widest to the smallest lens aperture. As you can see, the peak lens performance for this lens is achieved at the midpoint aperture setting of f/5.6 at the minimum focal length and f/8 at other focal lengths. This graph was created with data obtained using Imatest software (www.imatest.com).

The graph shown here was supplied by Jon Tarrant and was taken from one of his *What Digital Camera* (www.whatdigitalcamera.com) lens tests.



Figure 3.5 This shows a comparison of a close-up detail shot using the Canon 28–135 mm lens featured in Figure 3.4 at the 28 mm zoom setting. Seen here are details from the widest aperture (left), the optimum aperture (middle) and smallest aperture (right). A layered image is also available on the DVD.



Figure 3.6 Here is a landscape photo that was shot in South Africa using the Canon EOS 1Ds MkI (11 megapixel) camera with an EF 24–70 mm Canon lens.



Figure 3.7 Here is a close-up view of the above photograph. As you can see, this 11 megapixel photo still has plenty enough detail to produce a large poster print.

Fine-tuning the auto focus alignment

Here is a subject that I have to say only recently caught my attention when Jeff pointed out to me that some of the latest high-end digital SLR cameras allow you to make micro focus calibration adjustments. This is something that had never occurred to me before since I had always assumed both the manual and automatic focusing to be fairly accurate on such cameras. However, as I was about to find out, this isn't necessarily always the case.

There are two issues at stake here: one is the accuracy of the auto focus detection mechanism in estimating the exact, correct focusing distance to produce a perfectly sharp image on the sensor. The other issue is to do with the accuracy of the focus screen used for manual focusing and whether the light path distance to the glass screen is exactly the same as that to the sensor. I am reminded here of what happened to a photographer's assistant who accidentally broke the ground glass screen of his boss's 5×4 plate camera. Not wanting to incur the wrath of the photographer (who was known to have a nasty temper), he set about finding a replacement screen and fixed it himself. The only problem was he put it in the wrong way round with the ground glass facing outwards and was caught out anyway.

Anyway, I digress. If there is even just the slightest amount of deviation in the physical distance for the screen, the sensor or the lens itself, this can result in minor fluctuations in focusing from the assumed factory standard. The main variable here is the lens itself and it is interesting, if not shocking, to discover just how much variance there might be between an individual lens and the 'assumed' lens focusing behavior.

Enter the LensAlign® system (www.lensalign.com), a calibration tool designed by Michael Tapes that provides a method for calibrating the lens focusing in those digital SLR cameras that provide a custom auto focus calibration setting control. These include the latest Canon EOS 1D MkIII, 1Ds MkIII, 5D MkII, the Nikon D3, D3X, D300 and D700, plus several more. Now I admit I do happen to know Michael, but my purchase of LensAlign came from a genuine desire (and need) to calibrate the lenses I shoot with and I have to say I'm glad I did, because it has revealed significant focusing errors with a couple of the lenses I use regularly.



Figure 3.8 The LensAlign Pro calibration tool.

Stored calibration settings

Providing you make the focus calibration adjustments on a per lens basis, the camera stores this information in its internal memory and automatically knows in future just how much correction to apply to the auto focus for whichever lens you choose to shoot with.

Here is how it works. The LensAlign calibration tool comes in two versions: Lite and Pro. Both offer the same degree of accuracy, but the Pro version is larger, more robustly built and can be adapted to take a long lens ruler adapter (Figure 3.8). Basically, you begin by setting up the LensAlign assembly so that it is aligned straight-on to the camera and at an optimal distance from the chart of $\times 25$ the focal length of the lens to be tested. There are instructional videos on the website that show you how to do this and the tool is cleverly designed to allow you to check the alignment by spying through a tiny aperture at the back as well as when looking through the camera lens itself. Once aligned for the camera body and lens combination you wish to test, you set the lens aperture to its widest setting and simply let the auto focus system of your camera focus on the main target and take a picture. Now, because the ruler scale is positioned at an angle to the camera, when you examine the captured image in close-up, you can use the numbers on the ruler scale to help determine whether the focusing system of your camera is focusing correctly or not (i.e. when the sharpest detail on the ruler scale is at the zero point).

If it turns out that the camera and lens combination is not focusing correctly, you can now work out if the error is due to front or back focusing. Armed with this information, you then need to locate the Auto Focus calibration setting from the camera menu and try making a calibration adjustment for the lens you are currently shooting with. Shoot another test and see if this improves the focus accuracy. Once you have worked out the appropriate level of correction that's it, you can move on to test other lenses.

As I say, I was both impressed and shocked by what I found. One of my lenses required the maximum amount of front focusing correction available in order to achieve optimum sharpness (see Figures 3.9 and 3.10). The difference between the before and after is quite staggering. Bear in mind here that this test is designed to show up the focus accuracy at the widest lens aperture. When shooting normally it very often won't matter if the focusing is slightly out since at least some points in the photo will be at maximum sharpness and at smaller apertures the depth of field will increase to compensate and bring more points into apparent sharp focus. However, it is reassuring to know that for those times when pin-sharp focusing is required at wide apertures, there is now a way to ensure the focusing is as spot on as possible.

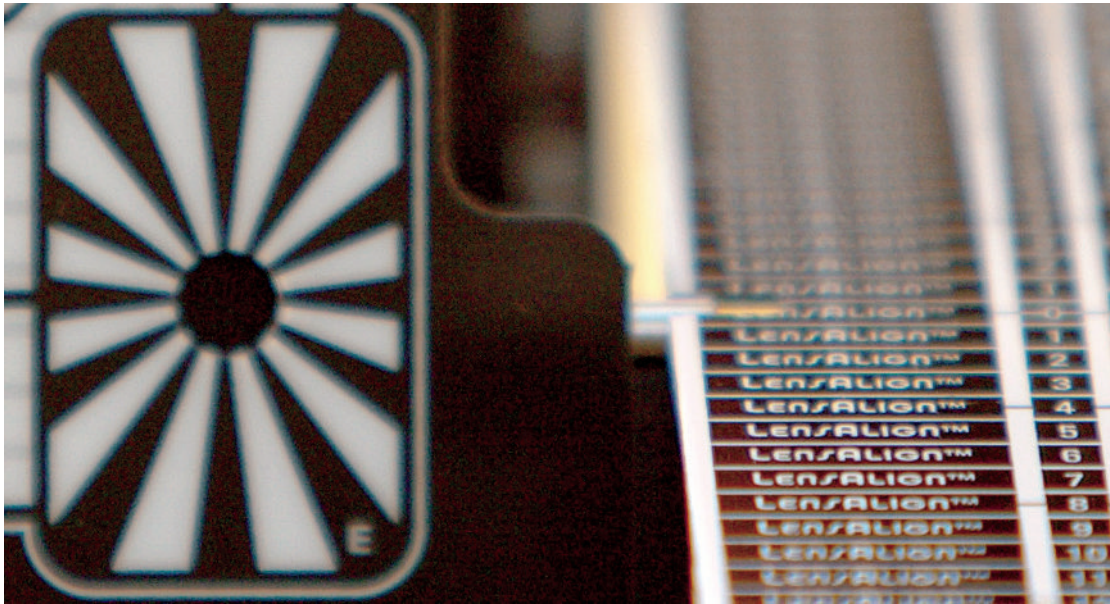


Figure 3.9 Here you can see a close-up view of an initial lens test in which the auto focus mechanism was clearly off target and front focusing.

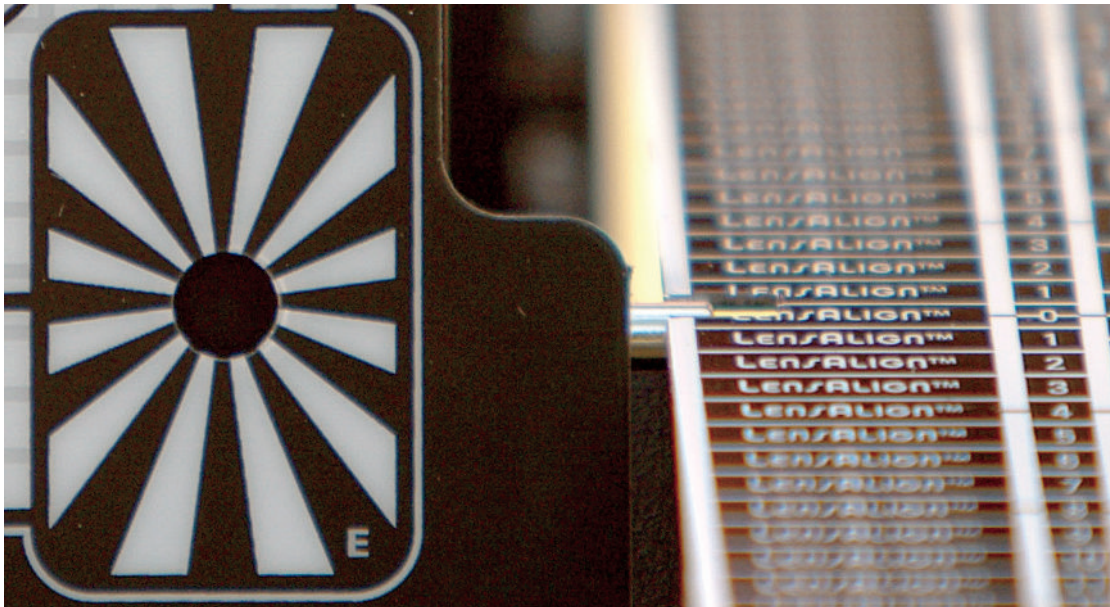


Figure 3.10 In this example you can see how the LensAlign target was captured after I had applied an auto focus calibration adjustment via the camera.

Using Lens Corrections to improve IQ

Even if you use a great lens properly focused to make a shake-free exposure, the odds are that the capture will have issues due to lens defects. Lens designers try hard to design out as many lens defects as possible but even great lenses will show signs of distortion, chromatic aberration and lens vignetting. In Photoshop CS5 and Camera Raw 6 photographers can correct for these defects after the fact, computationally. Figure 3.11 shows an image I shot in Trafalgar Square with a Canon EF-S 10–22 mm lens that needed lens perspective correction.



Figure 3.11 The image on the left is before any lens correction. The image on the right is after basic lens profile corrections, but not perspective corrections, in Camera Raw.

In examining the differences shown above, the obvious change was to lighten the corners of the image to remove lens vignetting. You may also be able to see a reduction in the barrel distortion, which bows out without the correction (pincushion distortion bows in). What you can't see at this size is the lateral chromatic aberration, which is the inability of a lens to focus all colors of light at the same size. This results in color fringing, which is particularly noticeable in the corners of a wide-angle lens shot. You may also note that both of the above images are crooked. Normally, I would correct the rotation of an image to level it early in a processing session (I really hate it when images are 'slightly off'). However, with the addition of the manual transform controls in the Lens Correction panel, I find it useful to do a rotation correction there along with keystone corrections rather than using the leveling function of the crop tool.

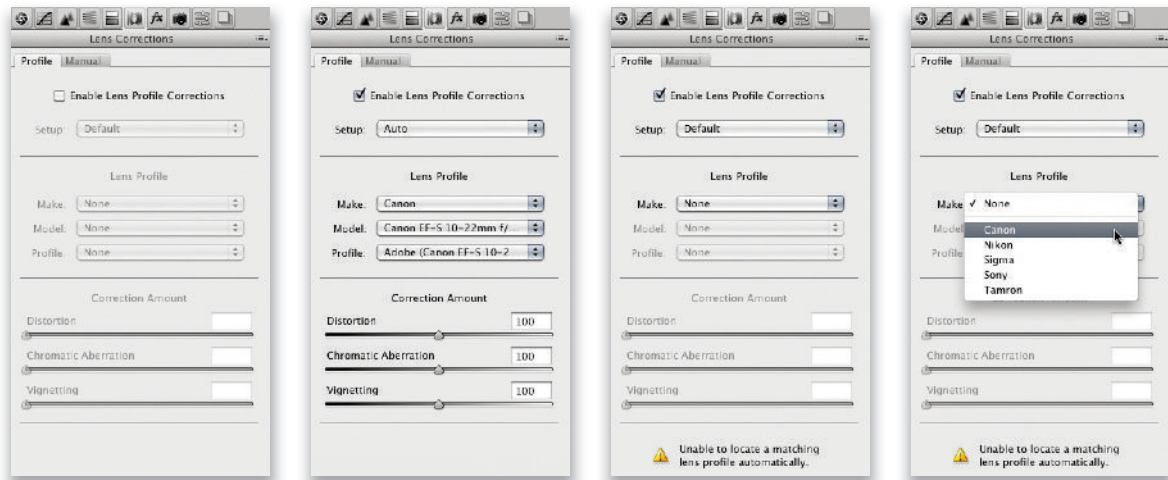


Figure 3.12 The Profile tab of the Lens Corrections panel in Camera Raw allows you to automatically select a lens profile for supported lenses. Above left is the panel with the Enable button unchecked. The second panel shows Camera Raw automatically selecting the profile for the Canon EF-S 10–22 mm lens. The third panel shows what happens when a lens can't be found in the lens database. The final panel on the right shows the current list of lens manufacturers whose lenses may have been profiled. Not all lens have yet – it's an ongoing process.

Figure 3.12 above shows a series of displays you'll see in the Profile tab of the Lens Corrections panel. The panel is similar to the Lens Corrections feature of Photoshop CS5. Both use the same potential set of lens profiles (there are different profiles for raw and JPEG images). Also, while Photoshop can actually search online for new profiles (as shown in Figure 3.13), Camera Raw can't yet. This initiative by Adobe to offer automatic lens profile based corrections has been a massive effort. Unfortunately, not every lens has been profiled yet. So Adobe is enlisting the help of the user community to add custom lens profiles made by users and submitted to the lens profile database. You can download the free Adobe Lens Profile Creator from the Labs.Adobe.com website. The process is to print out a specially designed target, shoot it in the prescribed manner and run the images through the Lens Profile Creator application. Making a simple one-shot profile for a fixed focal length lens at a single f-stop is pretty easy. But shooting a series of focal lengths of a zoom lens and adding additional subject distances and f-stops is a serious task. Figure 3.13 shows the result of a profile search in Photoshop.

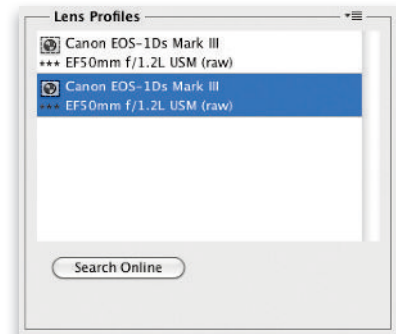


Figure 3.13 This shows a detail of the Lens Corrections feature in Photoshop CS5. The Search Online button can be used to search the Adobe lens profile database for newly added Adobe or user-made profiles. The dialog is showing the results of a search for a Canon EF 50 mm f/1.2 lens. There are two, both made by me. I suggest you select the second one since I kinda screwed up the first profile (but I couldn't unload it from the lens database).

Impact of the lens corrections

Like any interpolation algorithm, the lens profile and manual transforms will result in a softening of the image. The better the original image quality you have, the less noticeable the interpolation will be on your image. For this reason you should always double check and adjust your image sharpening settings after you've made the lens and manual transform adjustments.

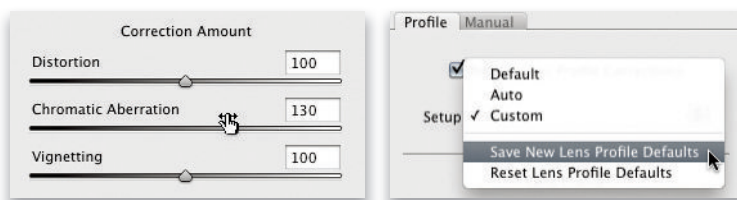


Figure 3.14 On the left are the Correction Amount sliders that allow you to tweak the amount settings. On the right, the Setup drop-down menu is showing the ability to Save New Lens Profile Defaults. Once you do that, whenever Camera Raw detects the lens it will apply the profile plus your custom amount tweaks.

The Correction Amount sliders allow you to override the default correction amounts. Figure 3.14 shows how I adjusted the Chromatic Aberration amount up to 130. I've found that while the original Chromatic Aberration corrections are good, I usually need to run the amount up to 120 to 130 for most of my lenses.

The Lens Corrections panel also includes a Manual tab that offers manual transforms above and beyond the profile-based corrections. Figure 3.15 shows the panel as well as the image with transform adjustments being made. You'll note I turned on the grid overlay by pressing the **V** key. I zoomed into the image and tried to align important image detail such as building edges to the grid

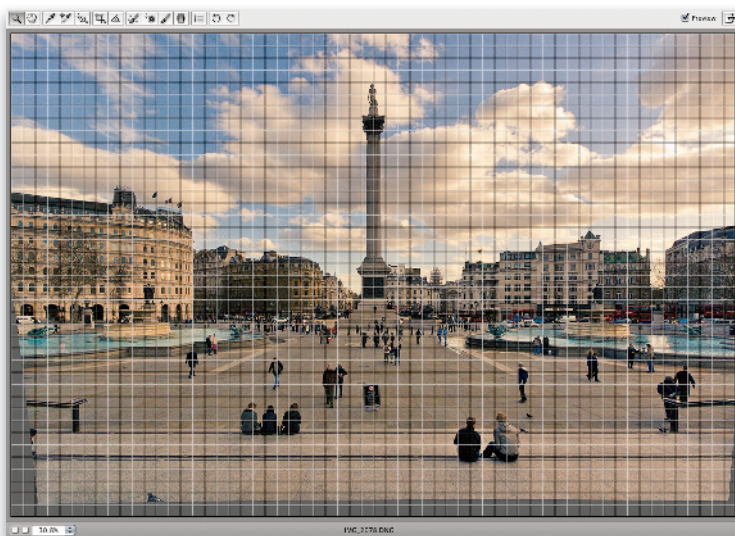
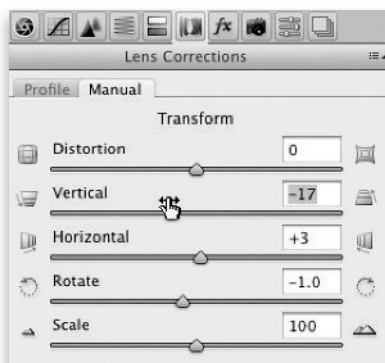


Figure 3.15 The Manual tab of the Lens Corrections panel allows for manual transforms (left). The image on the right shows the grid overlay and the added gray area.

to make the adjustments of the perspective corrections and rotation more accurate. I also find it is useful to target a transform field and use the up and down arrow keys for more precise adjustment settings. Adjusting the perspective corrections always requires very accurate rotational corrections – sometimes the interaction is tricky.

Figure 3.15 also shows what happens when the transform has run out of real image data and how it adds a filler area of gray. You can choose to render the image with the added gray area or crop it out. If the gray area is a simple texture that Content Aware Fill will easily handle, I tend to keep it. In this example, however, I had shot the image loose enough that I chose to crop the gray area out. Figure 3.16 shows the Crop tool option that allows you to constrain or not constrain the crop to the actual image area. The final image seen in Figure 3.17 shows the result of the original lens profile correction, the additional Chromatic Aberration amount tweak as well as the transforms that were applied in Figure 3.15.

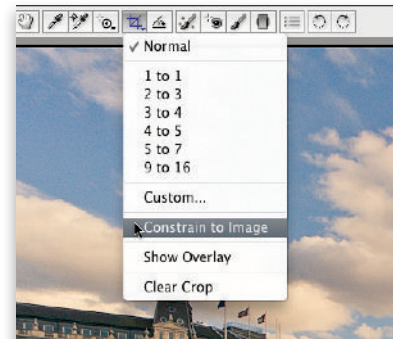


Figure 3.16 Above is the Crop tool menu showing the ability to select or deselect the option to constrain the crop to the actual image area only.



Figure 3.17 The final results of the Lens Correction panel adjustments.

PhotoKit Sharpener

PhotoKit Sharpener's sharpening workflow has proven to be successful – so much so that Adobe wanted Bruce Fraser to work with Thomas Knoll to incorporate the capture sharpening principles into Camera Raw and, later, output sharpening directly into both Camera Raw (5.2 and above) and Adobe Photoshop Lightroom. Unfortunately, Bruce passed away before seeing the results of the collaboration but I filled in for Bruce and helped complete the project. We're sure he would have been pleased.

Capture sharpening workflow

Even if you employ technical excellence in the capture of your image, you will still need to use image sharpening in Camera Raw or Photoshop. Why? Because the very process of digitizing an image softens the resulting image pixels. The problem then becomes when and how to sharpen your image. Bruce Fraser made a conceptual breakthrough when he devised the 'sharpening workflow' approach. The scheme was to break down the sharpening into three phases: 'Capture Sharpening' upon first opening an image, 'Creative Sharpening' for addressing local sharpening or smoothing, and 'Output Sharpening' at the last stage when the final size and resolution of an image are known. We'll cover capture sharpening here because it has such an impact on IQ.

Capture sharpening depends on both the source of the image and the image content. The content part of the equation is critical. For optimum sharpening, you need to adjust for the edge frequency – a higher radius for low frequency and a lower radius for high frequency edges. Figure 3.18 is an example of a low edge frequency image and shows the Detail settings used. While setting the Radius correctly is the first big step, it's really using the

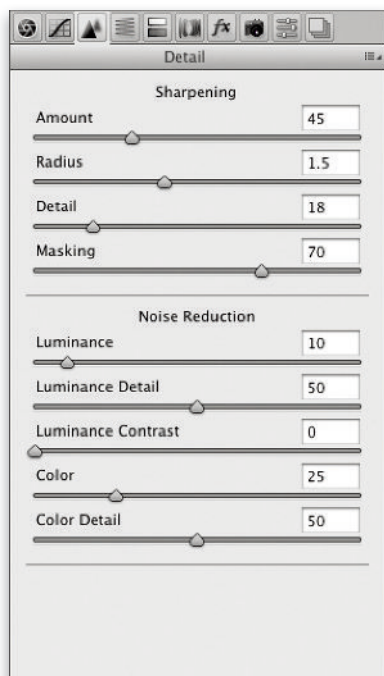


Figure 3.18 With the image at a 100% zoom, the aim is to adjust the image until it looks 'good' at that zoom. The Radius was set to 1.5, which is appropriate for a portrait containing low edge frequency.



Figure 3.19 The image on the left is with no sharpening applied. The image on the right is with sharpening turned on. Both images are at 200% zoom, so the sharpened image will look slightly over-sharpened.

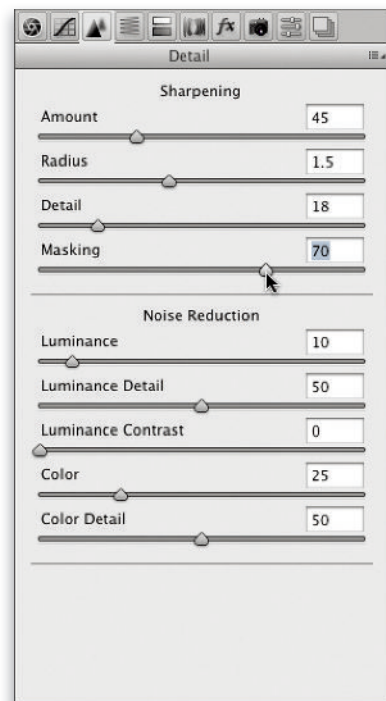
Masking that allows proper sharpening to be applied to those areas that need it, such as the eyes, lips and hair. Figure 3.20 shows the result of the masking preview. The white areas represent the edges which we want to sharpen and the black areas the surface areas which we don't. Setting the Radius and Masking properly allows us to use a more aggressive amount, which will optimize the detail in the image.



Figure 3.20 This shows the Figure 3.18 image with the Masking preview (hold down the **alt** key while moving the slider) showing the edges and surfaces of the image. The Masking slider is set here to 70, which is a common setting for portraits.

Determining edge frequency

An easy way to determine an image's edge frequency is to imagine a horizontal line across the image. Images with low frequency tend to have fewer alternating strong lights and darks, such as this portrait. Landscape images often have high frequency edges and need a lower radius setting. Of course, sometimes an image has a mix and for that you need to take some extra steps.



For a portrait, it's also useful to lower the Detail slider to kick in the halo suppression it provides while reducing the emphasis on high frequency detail (the other thing the Detail slider does). The higher the Detail settings the more the sharpening concentrates on detail and allows stronger halos – which are not 'bad' as long as they are invisible when zoomed to 100%. The other thing to pay attention to is while there are four sliders called Sharpening, there's really a fifth slider that comes into play and needs to be set properly: Luminance Noise Reduction. Most images need at least some slight noise reduction even though it's off by default, and with the Figure 3.18 portrait image I found adding a Luminance setting of 10 to be sufficient.

For images with higher frequency edges – which are common for landscapes – the Radius should be lowered and often the Detail slider increased. Figure 3.21 shows the result of aggressive Detail and Amount settings with the Radius setting reduced from the default of 1 pixel to a setting of 0.7 pixels. The image is sharp, but without halos at a 100% zoom that would interfere with subsequent sharpening rounds in later phases (although the odds of needing creative sharpening are not high here).

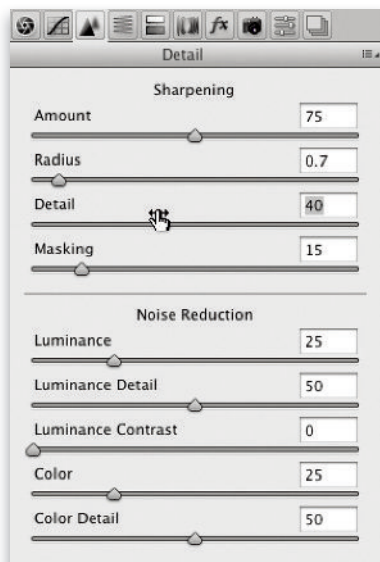


Figure 3.21 This shows an example of an image with high frequency edges – lots of alternating lights and darks and small detail. Here the Radius was lowered to 0.7 and the Detail slider set to 40. Notice the Masking was still being used at a low setting and Luminance Noise Reduction had been applied.

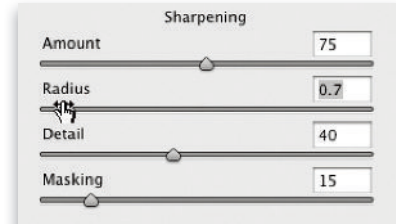



Figure 3.22 This shows the Figure 3.21 image with the Radius preview (hold down the  **alt** key while moving the slider) showing the Radius setting at 0.7. The image is shown here at a zoom of 200%.

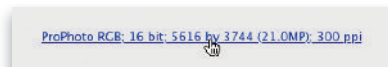
Figure 3.22 shows the Radius setting being reduced to 0.7 with the preview visible. Previewing the Radius (as well as the Detail slider) allows you to more accurately arrive at optimal settings. The image, shot on a Canon EOS 1Ds MII at ISO 200, benefited by adding noise reduction. Increasing the noise reduction setting also allows you to increase the strength of the Detail slider.



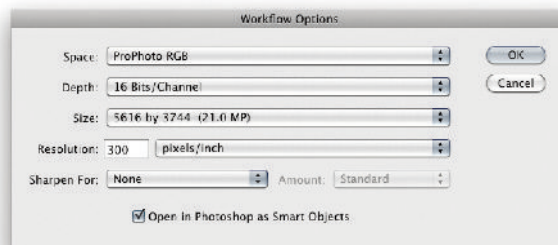
Figure 3.23 This shows the Figure 3.21 image at a screen zoom of 200%. The image on the left is shown here with no sharpening and the image on the right has the sharpening settings shown in Figure 3.21 applied to it.

So, that's all well and good if your image falls neatly into one of these two categories, but what about an image that has a mix of frequencies that puts it squarely in between? Well, you could compromise and adjust the settings to the middle ground, but that's not really optimal. For special cases where capture sharpening needs a blend of two types of sharpening – high and low frequencies – the best option is to optimize for both and composite the results in a single file. Creating two differently capture-sharpened copies of the raw file as Smart Objects allows you to blend between them.

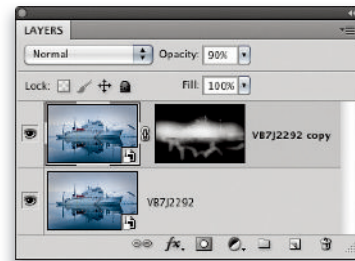
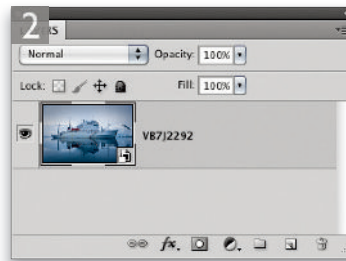
Using Smart Objects with Camera Raw allows you to combine the benefits of working parametrically inside Photoshop. This is because a Camera Raw Smart Object remains editable inside a Photoshop file. To have Camera Raw open a raw image as a Smart Object, click on the Workflow Options info button and check the option to open as a Smart Object in Photoshop as shown in Step 1. Note, this setting will remain sticky until you uncheck it.



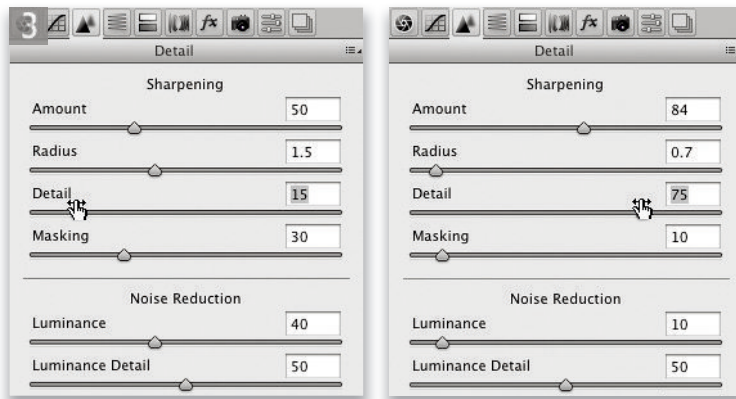
The Camera Raw Workflow info button



1 By checking the option for Open in Photoshop as Smart Object, the raw file was embedded in the Photoshop document and retained its editability until it was flattened.



2 The image was opened in Photoshop as a Smart Object (as shown in the Layers panel view on the left). The Layers panel view on the right shows how the bottom layer had been duplicated using Layer ⇨ Smart Objects ⇨ New Smart Object via Copy and a layer mask applied so the copy layer would only be blended in the center. To edit a Smart Object layer, all you have to do is to double-click the image icon.



3 Within each Smart Object, different Sharpening settings were used to deal with low frequency detail (as shown on the left, and placed at the bottom of the layer stack), and high frequency (finer) detail on the right, and placed above. Note that with the low frequency image, the Radius was higher and the Detail slider made lower, with the Masking set to 30. Also note that the Luminance noise reduction was set to 40, which killed all the noise in the sky and water. These settings remained editable in Camera Raw so that I could still fine-tune each of the Smart Objects.



4 This shows the final result of the Smart Object capture sharpen blend. The original image was shot at dusk with a Canon EOS 1Ds MII with a 24–70 mm F2.8 lens.

Is it noise or image detail?

One of the issues in determining whether or not noise is going to be a problem in the final reproduction is that we currently can't accurately judge noise and image detail on a computer display. Even the best displays are only capable of about 110 pixels per inch (PPI). If you will be outputting your image at 300–360 PPI then your display is only about 1/3 of your image's resolution. If you zoom into the image to view at 100%, the problem is then that the image is about 3x as large as the print size. Ironically, one of the best ways of reducing the visual effect of grain is to downsample the image. Downsampling to 50% of the original size essentially makes the noise 1/4 less apparent. So, before you turn yourself inside out with anguish about image noise, be sure to see what the real visibility will be in the final reproduction.

Noise reduction

Noise is something that affects all digital images. If you shoot at the optimum ISO rating and proper exposure, the chances are you won't even see any noise. But as you increase the ISO rating the noise will soon become noticeable and perhaps objectionable.

The presence of noise, the 'noise signature' of a sensor, is actually determined by the sensor at the sensor's base ISO setting. Noise is there even at the lowest ISO, but it's just not really perceptible. When you increase the ISO setting, this increases the gain sensitivity of the sensor (which, bear in mind, is actually an analog device). The amplification of the signal coming from the sensor increases its sensitivity (and therefore its ISO rating), but it also amplifies the pseudo-random noise. The noise may seem random but there is actually a sequence that produces a pattern over time, so it's not really totally random. Note that increasing the ISO doesn't capture more actual photons, it only increases the sensitivity and this reduced photon count. Increased gain is where we start to perceive more noise in our captures.

There are two problems to address here; one is the color speckles caused primarily by demosaicing a Bayer array sensor and the other is luminance noise or the grain-like pattern that you see when you inspect an image in close-up. Figure 3.24 shows the two basic types of problem noise that can be reduced by image processing algorithms.

Inside Photoshop proper, you have a somewhat limited set of tools for noise reduction. The essential function is to blur the noise

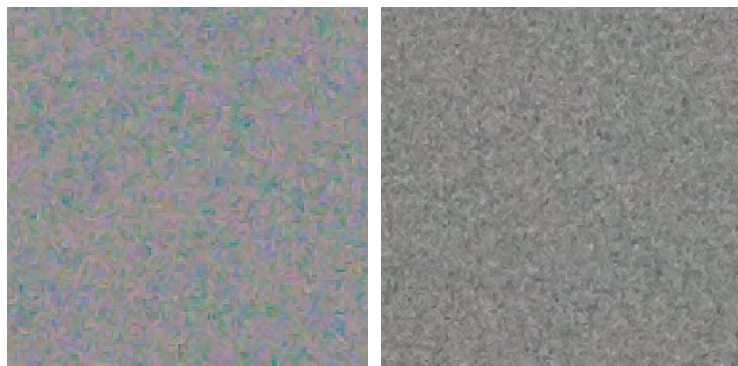


Figure 3.24 On the left is a typical example of color noise. On the right is pseudo-random noise that is primarily luminance-based noise. Both images are from a very noisy Canon EOS 10D (that I keep for noise demos) at 3200 ISO with a Photoshop zoom of 400%.

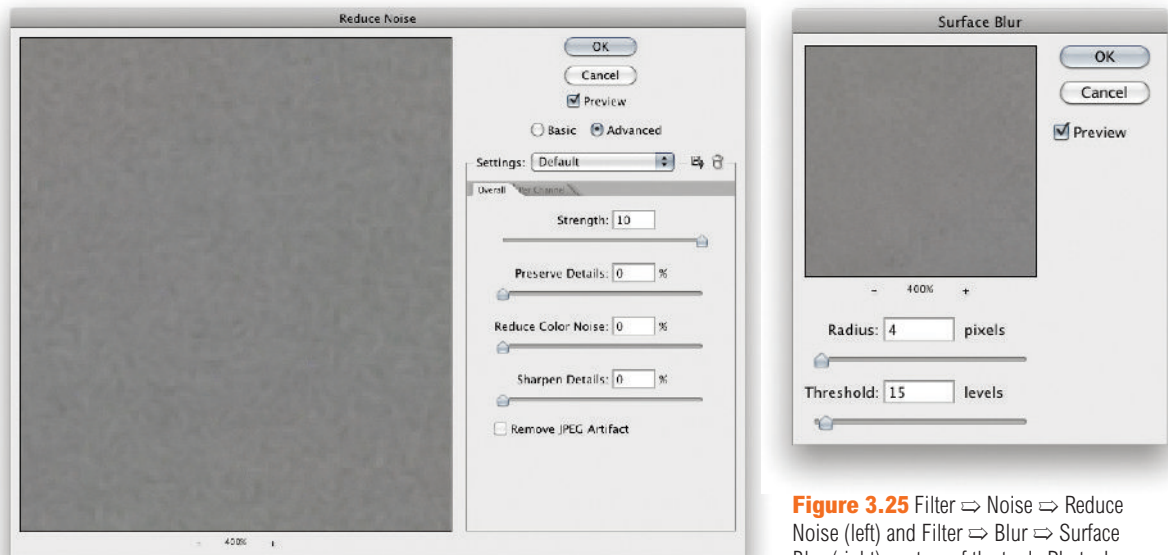


Figure 3.25 Filter ⇒ Noise ⇒ Reduce Noise (left) and Filter ⇒ Blur ⇒ Surface Blur (right) are two of the tools Photoshop provides for noise reduction.

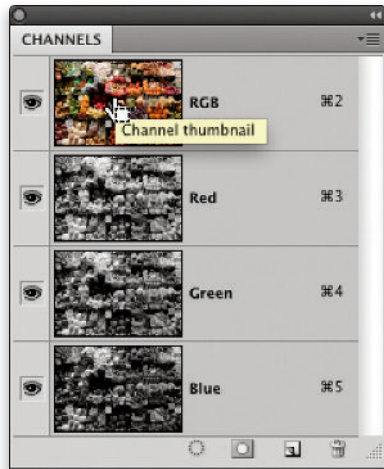
in the surface areas (non-edges) while preserving the actual image edge detail. The Reduce Noise filter offers a lot of functionality, as shown in Figure 3.25. However, Surface Blur is a simplified blurring tool which can be set to use a threshold to preserve edges. But, to preserve the edge detail I use a ‘surface mask’ to apply the noise reduction only to the surfaces. Figure 3.26 shows the image I’ll use to show how to make a surface mask. The outlined area in the main image is shown in the detail view at 400% zoom.




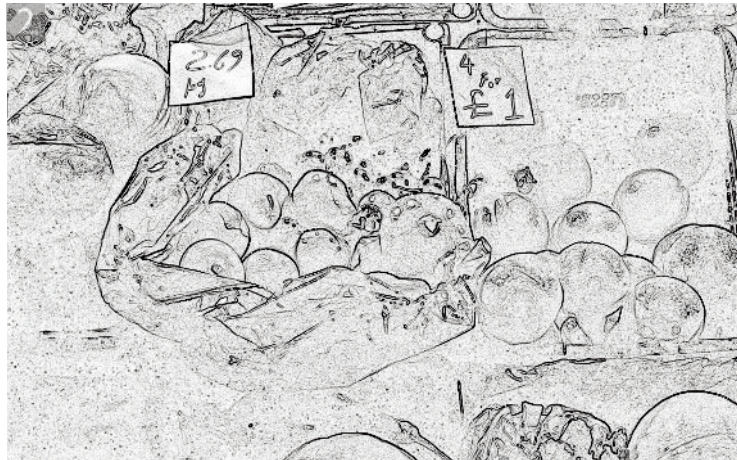
Figure 3.26 The image above was shot at ISO 1600 with a Canon Rebel XTi. The full image would reproduce 13" x 8.75" at 300 PPI. The detail image on the right is using the default Camera Raw sharpening but with no noise reduction.

Creating a surface mask in Photoshop

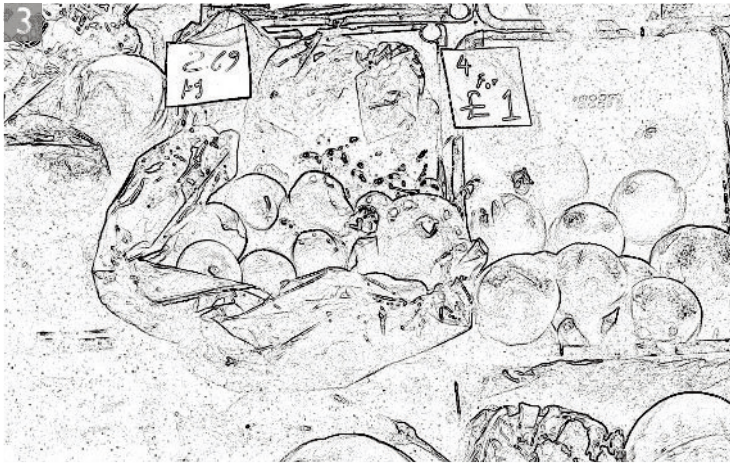
In order to create a mask to protect edges and apply the noise reduction primarily to the surfaces, a series of steps is required to create the mask from the data within the image itself. This makes the mask adaptive to the details and edges in the image.



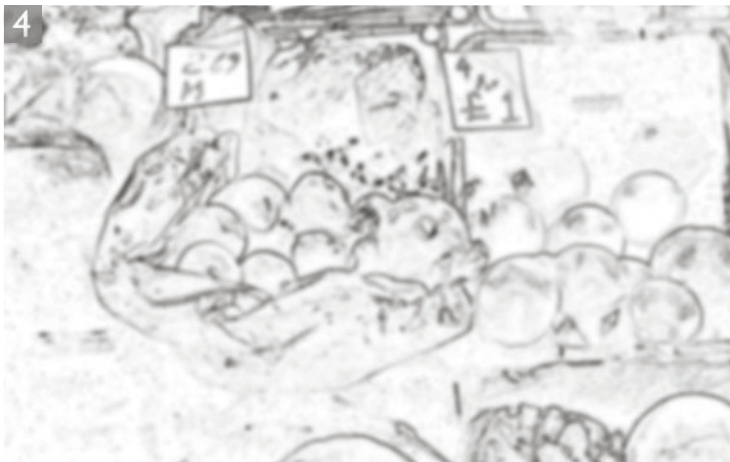
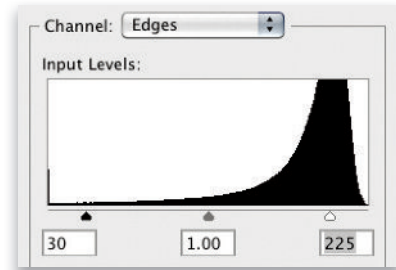
1 The first step was to load the image's luminosity as a selection and then save it as a channel. I tend to use the simple method of  **ctrl** clicking on the composite RGB thumbnail. Once saved as a channel you'll have the luminance data of the image, which can have a variety of uses.



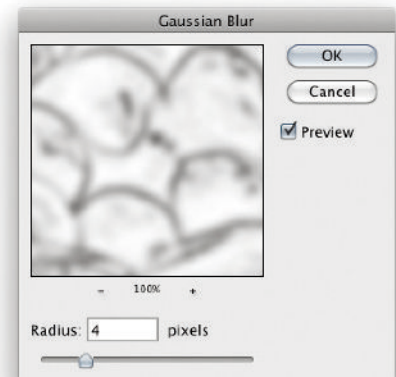
2 The next step was to extract the edge data. To do so, I applied Filter ⇒ Stylize ⇒ Find Edges. This filter does a pretty good job of finding the edges but the results usually need a bit of additional processing in order to produce a useful surface mask.

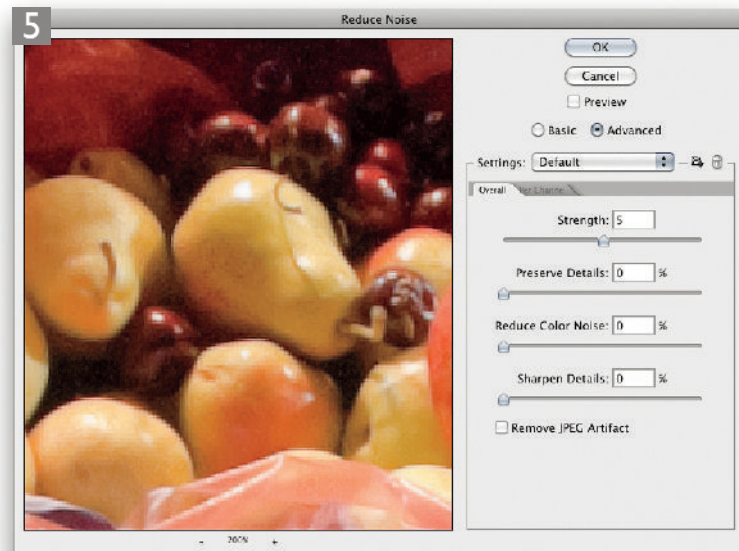


3 To reduce the amount of scatter noise in the mask, I used a Levels command to increase the overall contrast and clip a lot of the white data. I set the white clip to 225. There really isn't a precise number to the toning that needs to be done. This will vary image by image and will depend more on the nature of the image edges and the noise signature.

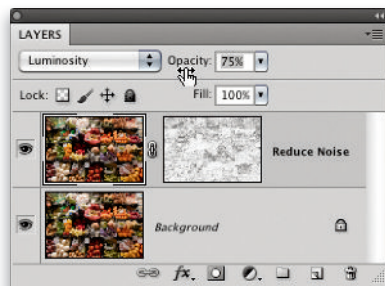


4 The final step in the additional processing to create an edge mask was to use the Filter ⇒ Blur ⇒ Gaussian Blur. In this example, I used a radius of 4. This setting is also image dependent and will need to be adjusted. It should be noted that up to the blur amount the steps taken so far are the exact same steps I used for creating an edge mask for image sharpening. The primary differences are the amount of the blur and a final step to invert the channel so the edges would be white and the surfaces black. Edge masks tend to need a bit less Gaussian Blur than surface masks.





5 After creating the surface mask channel, I went back to the RGB image data. I duplicated the Background layer and applied a 'medium strength' Reduce Noise filter without any Preserve Details settings because I could control surfaces and edge preservation with the surface mask.



6 I loaded the surface channel as a selection and used the selection to make a layer mask for the Reduce Noise layer. I also changed the blending mode to Luminosity and reduced the opacity to 75% to cut back on the over-smoothing.

If you compare the image detail of step 6 with the noise shown in the original in Figure 3.26, you'll see that the process did indeed reduce the amount of noise visible in the image. Was it worth the effort? Well, yes. But I would be inclined to do this in an action rather than manually producing the surface mask each time.

The real question is: are the results optimal for a digital capture? I would say no. Rather than working through the steps in Photoshop, my natural inclination now is to do everything in Camera Raw 6. The new noise reduction capabilities in Camera Raw 6.x and the Process 2010 version mean that I've started to do pretty much all of my noise reduction within the raw processing pipeline. The advantage of this is that the image sharpening and noise reduction processing are interconnected and controllable within one panel in Camera Raw.

Figure 3.27 shows the results of doing both the image sharpening and noise reduction in Camera Raw. It should be noted that the higher the capture ISO the more Camera Raw 6's noise reduction shines, as Martin will show next.

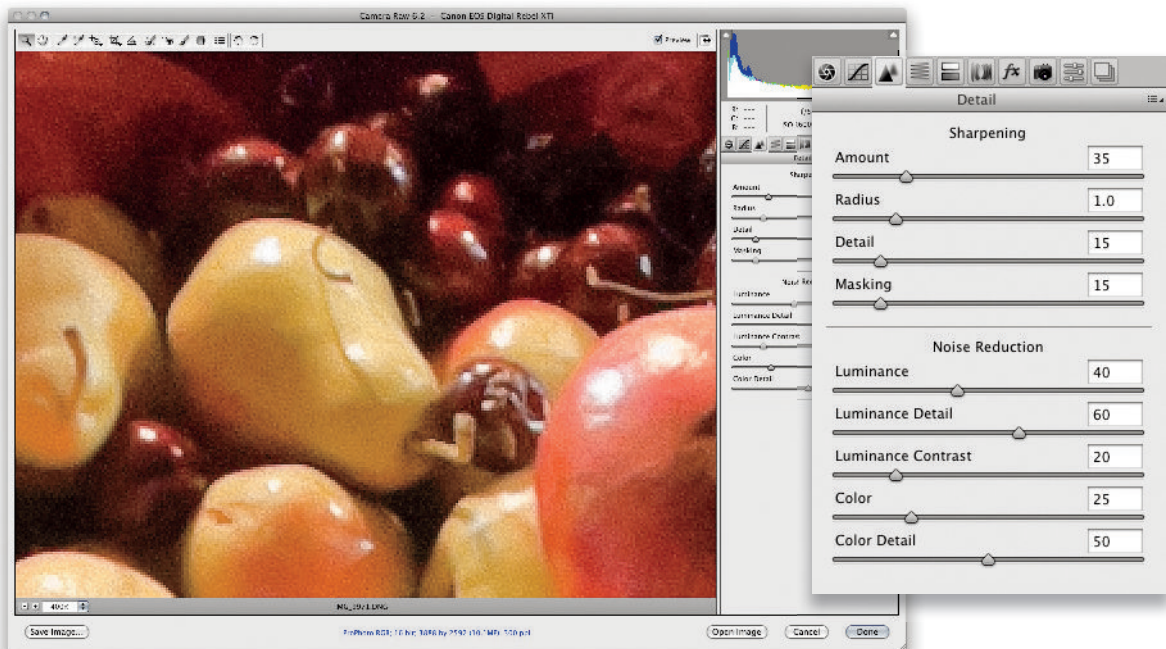


Figure 3.27 The image above, at 400% zoom inside Camera Raw, shows better noise reduction and image detail than the results produced using the Reduce Noise filter.

Third-party noise reduction

There are several third-party plug-ins for reducing noise, such as Noiseware™ by Imagenomic® and Noise Ninja™ by PictureCode®. Most of our experience has been with using Noiseware, which is very good at reducing film grain from scanned images.

Adding noise

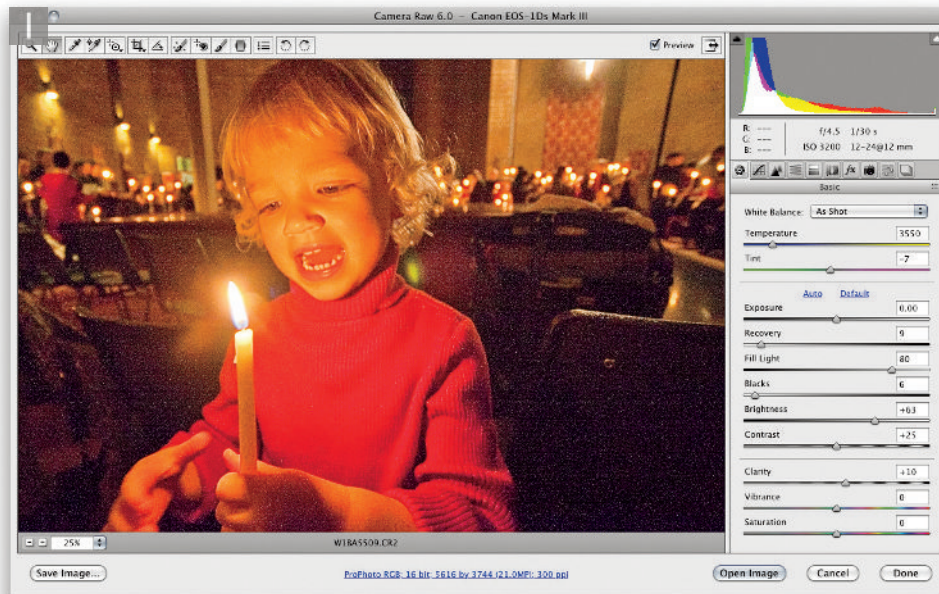
As well as removing noise you sometimes need to actually add noise instead. When you use Photoshop to retouch a photograph you may at times find yourself painting with what might be called ‘pure pixels’. If you are cloning pieces from one part of the picture to another then you are probably not going to run into too many problems, but if you use the paint brush tool and apply gradients or blurs to parts of a photograph, there can be a mismatch. This is where the smoothness of the pixels painted using Photoshop does not match the inherent texture of the rest of the image. This is particularly true if editing a scanned film image that contains a certain amount of grain. You should therefore consider selectively adding noise whenever you add a gradient or paint with Photoshop. You can do this by using the Noise ⇒ Add Noise filter via the Filter menu. Note that ‘add noise’ options are already included in a lot of Photoshop features such as the Brush options, Gradient Fill layers and the Lens Blur filter.

Camera Raw noise reduction

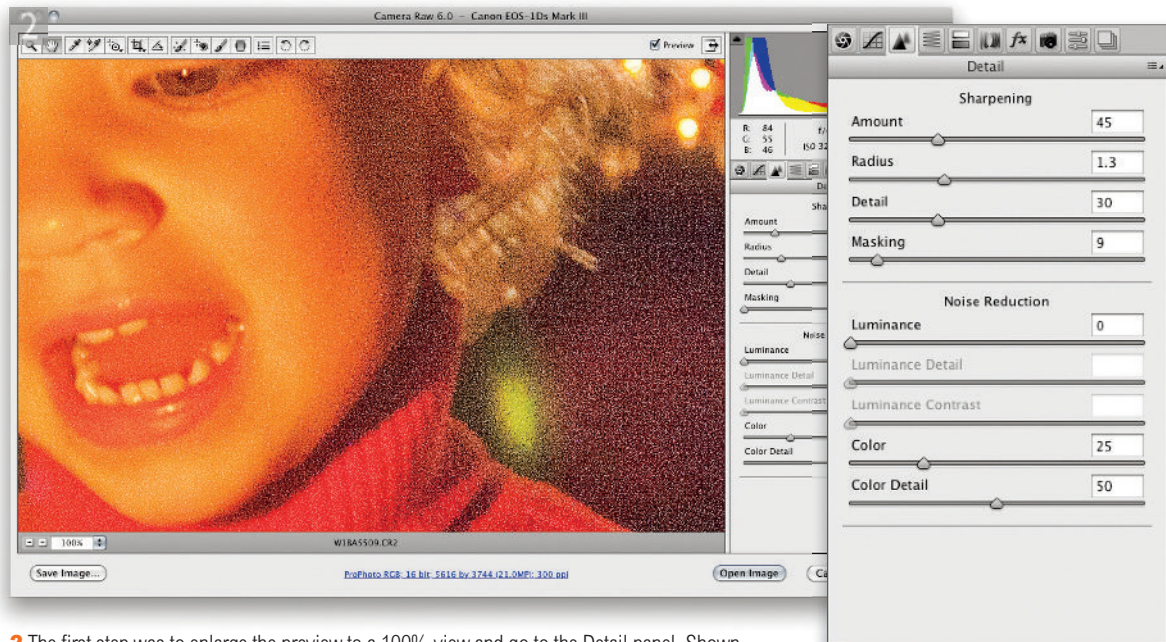
So far we have looked at how to use the Detail panel in Camera Raw to handle noise reduction. Now that we have the new improved noise reduction in Camera Raw 6 for Photoshop CS5, we believe it makes most sense to carry out the noise reduction in Camera Raw. As has already been mentioned, one of the key benefits of this approach is that once you have optimized the settings to remove the noise from one image you can then share these settings across multiple photos.

The new improved Camera Raw noise reduction now makes noise reduction in Photoshop almost completely redundant. I say ‘almost’, because there are still times where it may be helpful to use Photoshop to reduce the noise in tricky images. There is of course the Reduce Noise filter which has been around in Photoshop for a few years now. Personally, I don’t think this filter has anything special to offer now that you can carry out the noise reduction in Camera Raw. However, there are also a number of third-party noise reduction filters for Photoshop. These do arguably have some role to play still, especially if the aim is to reduce film grain in scanned images. I have used Noiseware™ by Imagenomic® for several years now and will probably continue to do so when treating scans from grainy film images.

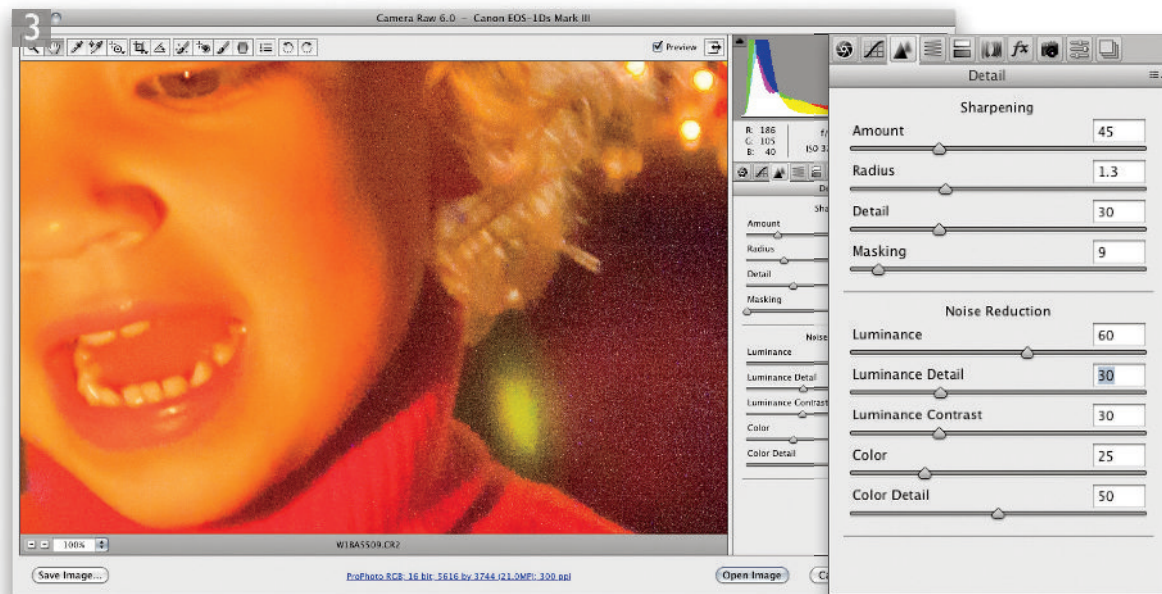
As I say, if you are editing raw images, then the Camera Raw controls should be all you need and I reckon the Camera Raw Detail panel is the more appropriate tool to use as your first port of call. However, there are some situations where even the new improved noise reduction in Camera Raw 6 can do with a little extra help from Photoshop. I have found a few examples where the Camera Raw noise reduction is unable to remove all the noise completely and have found it necessary to use some further Photoshop image processing to improve the look of such photographs. In the example that’s shown over the following pages a number of outlying pixels stubbornly remained in the image (these are the white speckles you can see in the Step 2 close-up view). No matter how I tried to remove them using the Luminance slider controls, I just couldn’t get rid of them completely in Camera Raw. Here is how I went about editing this particular photo in Camera Raw and Photoshop in order to get the smoothest result possible.



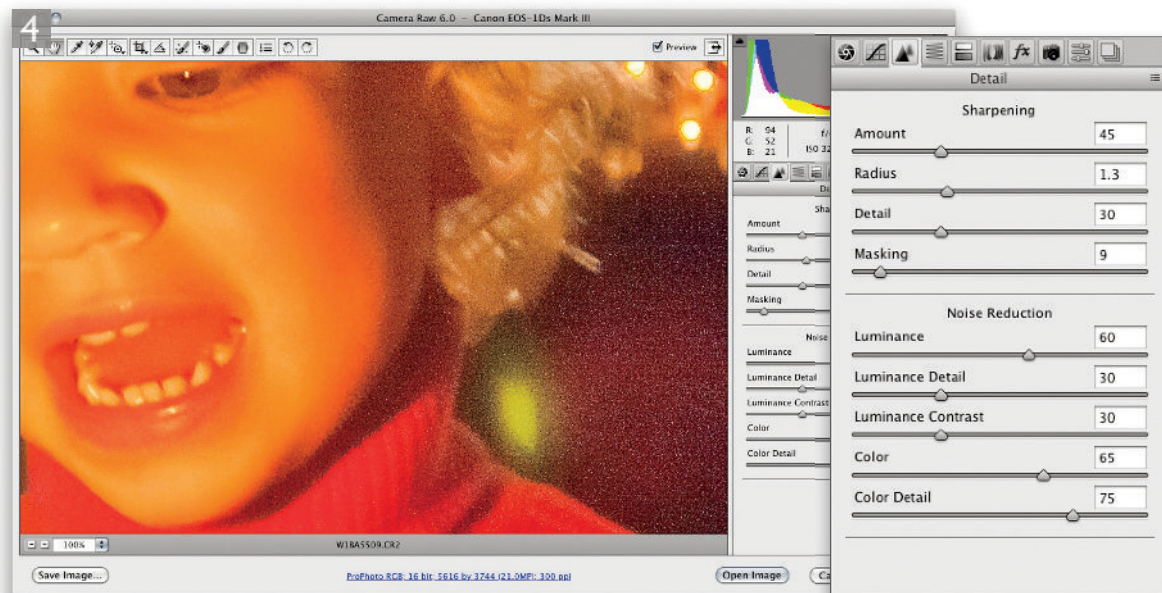
1 This photograph was mainly illuminated by candle light and was shot using a 3200 ISO setting. As you can see the image is very noisy.



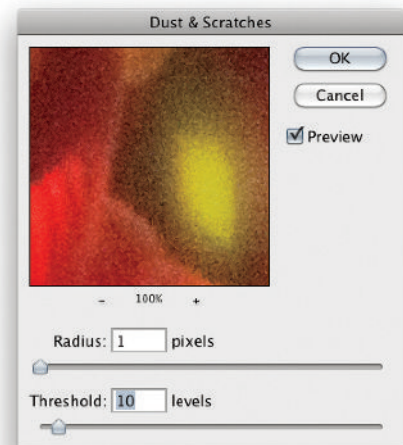
2 The first step was to enlarge the preview to a 100% view and go to the Detail panel. Shown here are the default noise reduction settings.



3 In this step I adjusted all three Luminance noise reduction sliders to remove the noise and at the same time retain as much image detail as possible.



4 I also adjusted the Color and Color Detail sliders to remove the color noise.



5 Here we can see the Camera Raw processed image opened in Photoshop (top). Camera Raw did a pretty good job of removing most of the noise, but there were still a lot of what we call 'outlying' pixels, which are the white speckles you can see here. To remove these, I went to the Filter ⇒ Noise menu and selected the Dust & Scratches filter. A 1 pixel Radius amount was all that was needed to eradicate the speckles, but I didn't want this filter step to soften the image too much, so I raised the Threshold slider to 10 levels. Basically, the Threshold slider acts here like a dampening control on the Dust & Scratches effect. As the Threshold is increased there has to be a greater pixel value difference between one pixel and a neighboring pixel before the Dust & Scratches filter comes into effect.

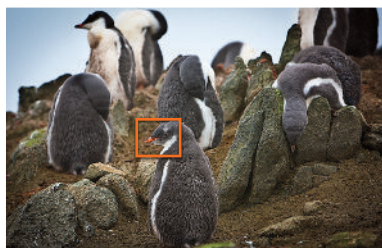


Figure 3.28 This image of a penguin chick was shot with a Canon EOS 1Ds MIII with a 70–200 mm F/2.8 lens at 200 mm and a shutter speed of 1/1000 of a second. The box shows the small area of the image that was used to show the results in the remaining figures on this page.

Grain addition

After telling you how to sharpen and then reduce the noise in images, it might seem a bit curious that I would turn around and tell you to consider actually adding grain. Since Camera Raw can now add grain, there must be a reason Thomas Knoll wanted it in Camera Raw. There is. It seems that after proper sharpening and noise reduction is done, images may have a ‘synthetic’ smoothness that can be eliminated by adding small grain back into the image. The key is to add smaller grain than the noise you started with.

In the example shown on these pages, getting a sharp image at capture was more important than shooting with a lower ISO. At ISO 400, I was able to shoot 2 stops faster and thereby get a sharp image. Figure 3.28 shows the full-frame view of the photo.

At the default Camera Raw sharpening settings, the close-up detail of the chick was technically sharp but was not yet fully optimized. Figure 3.29 shows the default sharpening settings (left) as well as the much stronger sharpening settings (right). As you can see, the image details were considerably sharper but so was the noise in the image. At this stage, the obvious answer was to add noise reduction. I could also cut down on the high detail setting of 42, but that would have reduced the non-noise image detail. This is always the struggle between sharpening image detail and reducing noise.

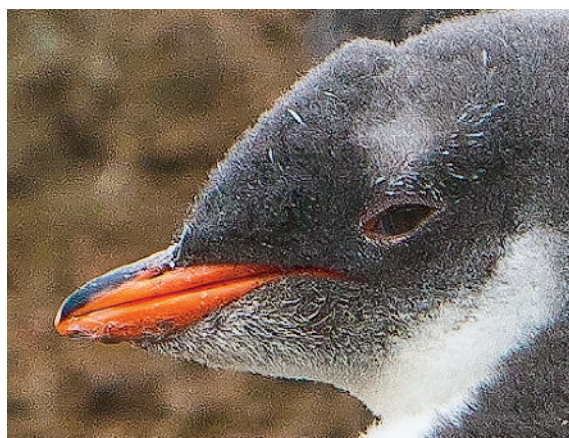
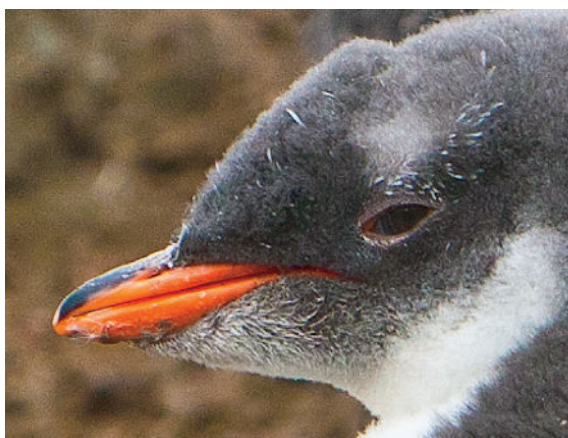


Figure 3.29 The image on the left is at the Camera Raw default sharpening settings. The image on the right has substantially increased settings of Amount: 76, Radius: 0.7, Detail: 42 and Masking: 15.

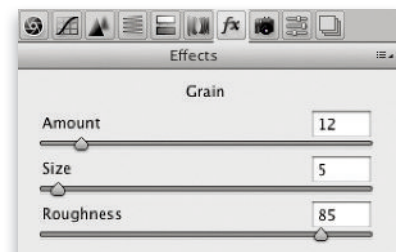
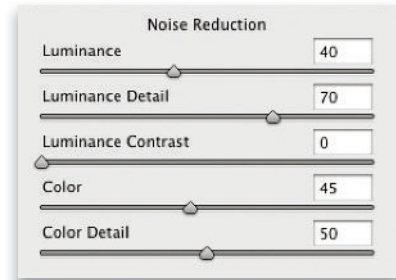


Figure 3.30 The image above has had fairly strong noise reduction added to reduce the increased noise.

Figure 3.30 shows the result of adding Luminance noise reduction as well as increasing the Luminance Detail. The results were reduced noise but with an introduced softness in micro-detail. That's where the grain addition can reduce the overall softness while increasing the appearance of greater micro-detail. The result is a more natural 'photographic' look that allows for a substantial increase in image sharpness while reducing the noise. The key to using the grain addition is to use a small Size combined with a fairly small Amount setting, as shown in Figure 3.31.



Figure 3.31 The image above has the grain addition shown on the right. The Roughness settings of 85 makes for a simulation of the clumps found in film grain.



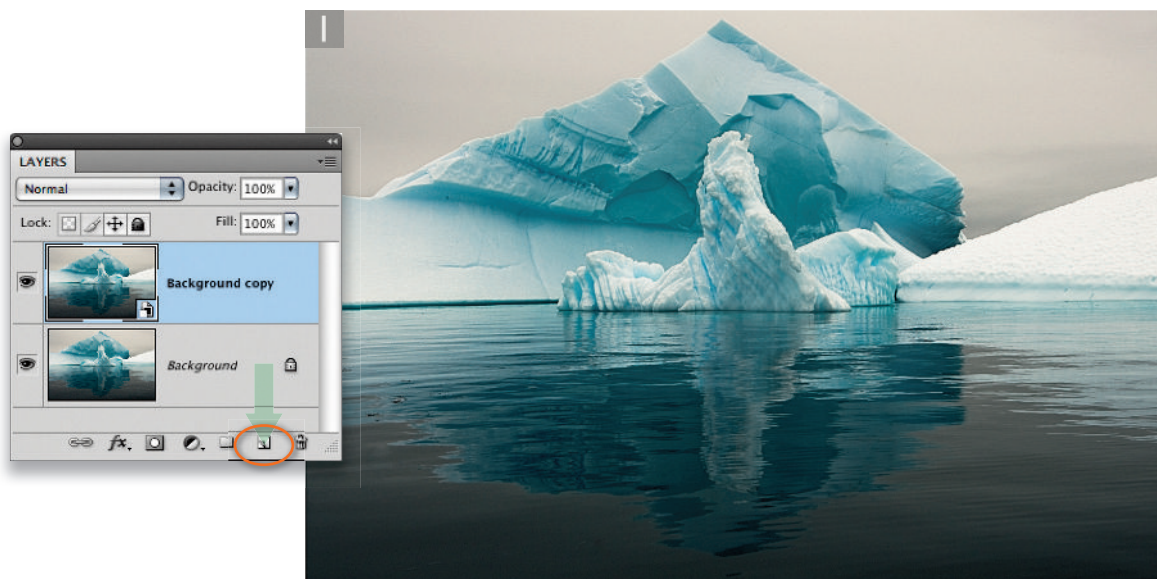
Smart Object limitations

You'll notice here that rather than convert the Background layer to a Smart Object directly, I had to make a duplicate of the Background layer and convert the copy layer into a Smart Object. It shouldn't always be necessary to do this in order to use Smart Filter layers, but in this instance I had to because the Smart Filter options don't yet include Blend If sliders (although I wish they did).

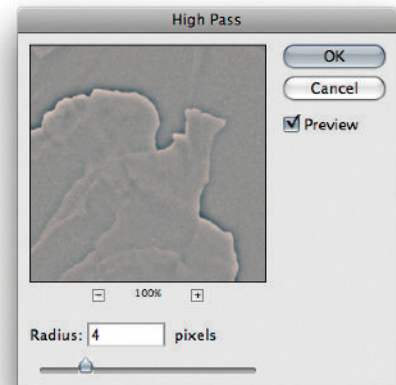
Improving midtone contrast

Normal image contrast adjustments affect the image globally, but if you wish to improve the contrast in the midtone areas you can use the following two techniques in Photoshop to add more presence to your images.

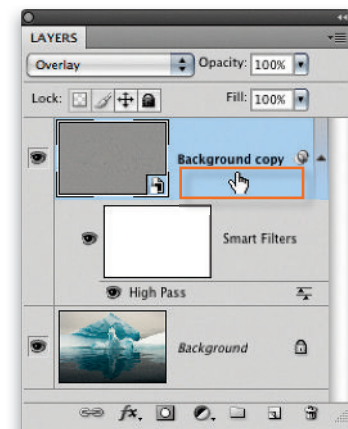
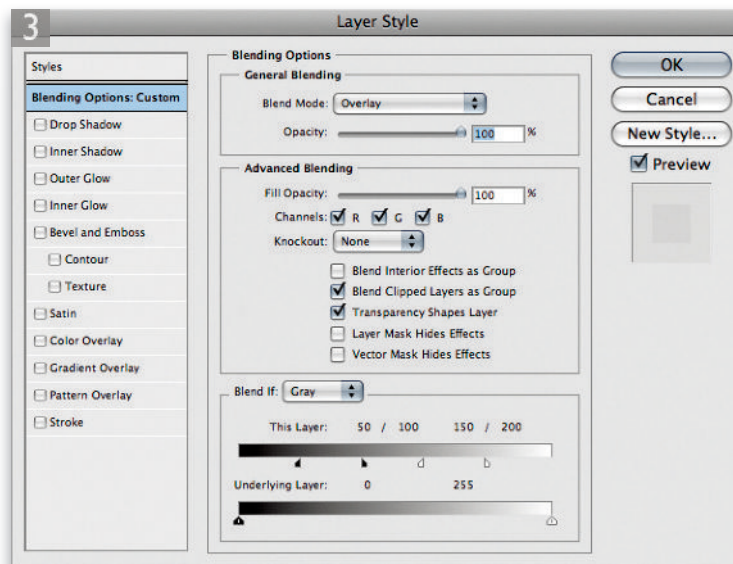
The first one is designed to specifically target the midtone areas by applying a small, soft halo edge to the midtones only. The second technique allows you to apply a wider, softer halo edge, which can help improve the contrast in areas that have soft detail. The Clarity slider in Camera Raw basically offers a hybrid of these two types of adjustment. By showing here the individual Photoshop methods that make up Clarity, you can learn how to apply more controlled Clarity type enhancements to your photographs. So instead of having just one slider to improve clarity, you can effectively have three slider controls at your disposal. We don't suggest you need to do this with every image, but you may find with subjects such as softly lit landscape subjects that these steps give you added control to help make the detail stand out more.




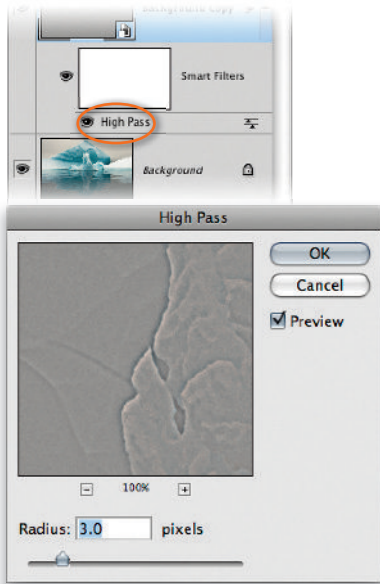
1 Here I wanted to demonstrate how the medium contrast technique could be applied to a photograph as a Smart Filter. To begin with, I dragged the Background layer to the New layer button in the Layers panel. I then went to the Filter menu and chose Convert for Smart Filters.



2 With the Background copy layer selected (which is now a Smart Object), I went to the Filter menu and chose Other ⇒ High Pass. It does not matter too much at this stage what value was used here since I was able to re-edit this setting later in Step 4.



3 Now that I had applied the High Pass filter, I needed to change the layer blend mode setting to Overlay. To do this I double-clicked on the Background copy layer, targeting the blank space area (this is the area within the orange box in the Layers panel and not the thumbnail or the layer name itself). I set the blend mode to Overlay and at the same time, went to the Blend If options at the bottom and adjusted the 'This Layer' sliders so that they were split as shown above: 50/100 150/200 (to set the sliders like this you have to hold down the  **alt** key to initially split them apart).



4 The layer blend changes made in Step 3 meant that the halo effect created in Step 2 was applied to the midtone areas only. At this stage you might want to double-click the High Pass filter layer in the Layers panel (circled) to reopen the High Pass filter dialog and fine-tune the Radius setting.



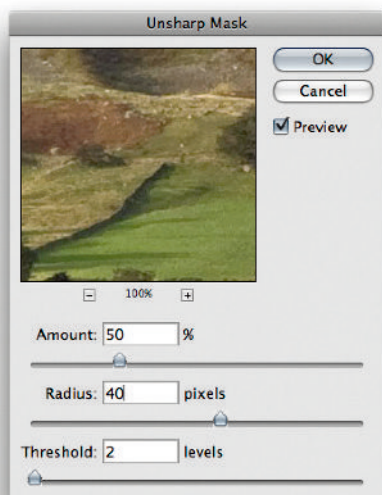
5 Here you can see a close-up view showing how the photograph looked after it had been processed using this technique, compared with how it looked before. The difference is quite subtle, but you should be able to see how it has enhanced the contrast in the midtone areas. Note how the ripples in the water are also better defined in the right half of the picture.

High Radius Unsharp Mask technique

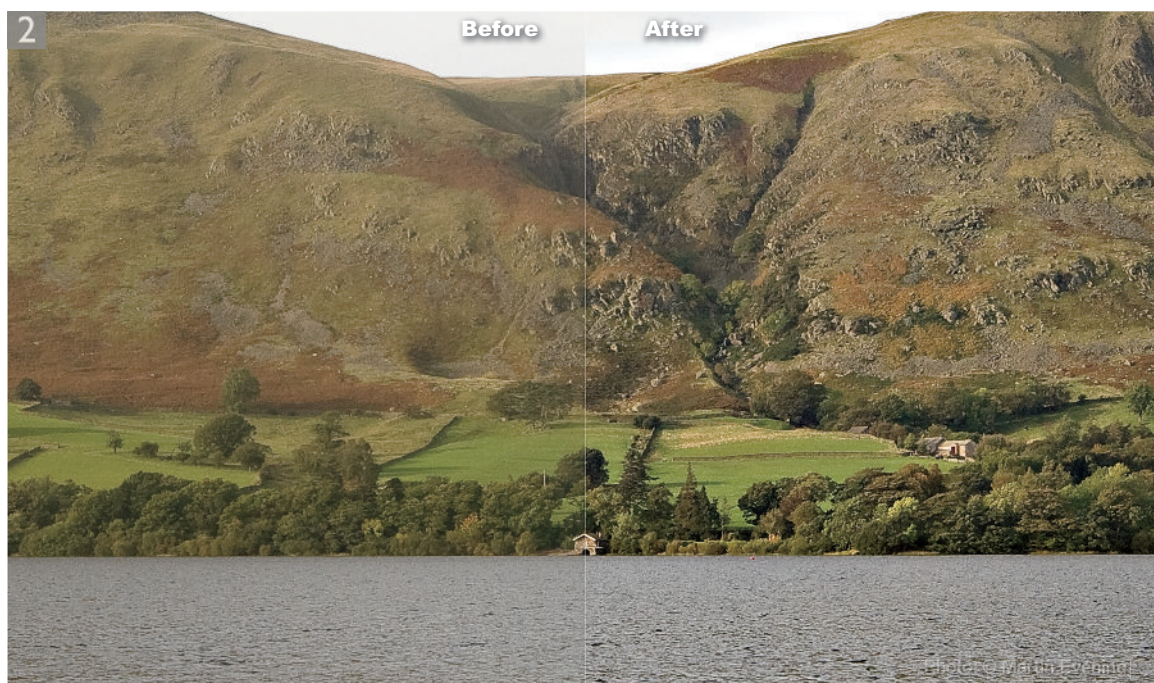
We know from experience that if we add contrast to a photograph this can make an image stand out more. Bumping up the contrast by adding an 'S'-shaped curve can certainly help improve the 'global' appearance of a photograph. However, if you add too much contrast, this can all too easily destroy the delicate tonal balance and ruin a perfectly good picture. The technique described here is another type of midtone contrast enhancing technique that allows you to add more contrast to a photo, but at a localized level.

It so happens that the human eye is more attuned to localized changes than to global changes in contrast and it was knowledge of this phenomenon that led Thomas Knoll at Adobe to propose a localized contrast enhancement technique based around the formula of using a high Radius and low Amount setting in the Unsharp Mask filter dialog. This in turn led Thomas to devise the new Clarity control for Adobe Camera Raw 4.1 and Lightroom 1.1 (incidentally, Michael Reichmann has written an excellent article outlining this technique, plus Thomas Knoll's thinking behind it, on the Luminous-Landscape.com website). As was mentioned earlier, on page 80, the Clarity adjustment combines the technique shown here with the midtone contrast technique described on pages 80–82. Even so, the 'high Radius/low Amount' technique is so effective when it's applied on its own that I thought it would be useful to share here. While this particular method of enhancing the midtone contrast is similar to using the Clarity adjustment in Camera Raw, when applying this technique in Photoshop you have the ability to selectively apply the effect. For example, following the steps shown on page 84 you could adapt this by first converting the background image layer into a Smart Object and applying the Unsharp Mask filter adjustment as a Smart Filter. You could then use the Smart Filter layer mask to selectively hide or show the filter effect.

In the example that's shown over the page, I chose a photograph where the atmospheric haze had softened the detail in the hillside in the distance. Here, you will notice how the low Amount setting combined with a high Radius created a soft shadow halo around the edges of the picture and this in turn helped remove a lot of the haze.



1 The first step was to choose Filter ⇒ Sharpen ⇒ Unsharp Mask and set the Radius to a really high value, such as between 30 and 70. This is a much higher Radius value than you would use normally and the trick is to keep the Amount slider to a low setting so that you don't end up applying too strong an effect.



2 This shows a 100% view, where you can see on the left the before version and on the right how the photograph looked after I had applied the Unsharp Mask filter. The difference can be quite dramatic. In this particular example the end result was like lifting a veil from in front of the lens.

Sculpting photos

Photography has always sought to represent three-dimensional scenes and objects in a two-dimensional medium. The most successful images tend to have an enhanced sense of shape and volume but mother nature doesn't always cooperate and provide the perfect light. Then it's up to the photographer to bring out the shape and volume using Photoshop. There are a lot of tools in Photoshop to help with that task, but sometimes it's best to use an alternative approach. Mac Holbert has perfected this technique (although others have used variations) to bring out the three-dimensional shape in images he prints for customers. It does employ a certain degree of brush work by hand (which always makes me nervous since I can't draw) but if I can do it, pretty much anybody can. You're always able to use Photoshop's extensive array of selection techniques to help in the painting.

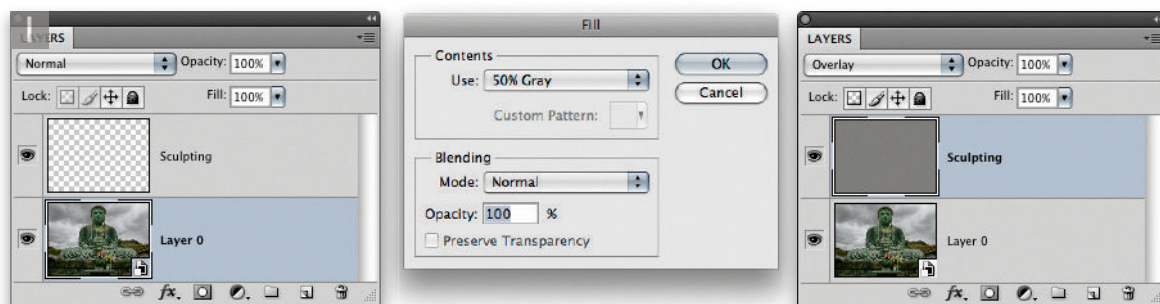
The sculpting technique uses a layer set to an Overlay blend mode and filled with a 50% gray to start. Since overlay is a procedural blend, it screens when above 50% gray and multiplies below 50% gray. This lightens the lights and darkens the darks. The starting gray layer does nothing until you paint with black or white. By adding white to the gray layer, the area becomes lighter. The addition of black to the gray darkens the area. The key is to do so very gently in order to enhance the natural shape and forms already in the image. See Figure 3.32 for a before and after. The steps start on the following page.

Nash Editions

Nash Editions was a California company founded in 1990 by Mac Holbert and Graham Nash to provide a specialist fine-art digital printing service. They were the original pioneers of fine-art inkjet printing. Mac used this technique to bring out the depth and give more shape to many of the images he printed for customers. Mac is also the newest member of Pixel Genius and is currently working on a revision to PhotoKit Sharpener.



Figure 3.32 The image on the left is prior to sculpting. The image on the right is the result. The result of sculpting cannot be exactly duplicated using adjustment layers – it's really a unique solution for adding shape and volume to an image.



1 To begin with, I made a new empty layer on top of the Smart Object layer. The fact that the raw image was a Smart Object meant that I would always be free to go back to the raw image to tweak it (although I didn't need to here). The empty layer was filled with a 50% gray and the blend mode was set to Overlay. Thereafter, when I painted with white into the Overlay layer it would lighten by screening and darken when painting with black by multiplying the image data underneath.

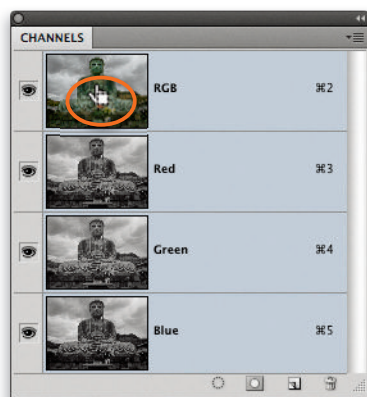


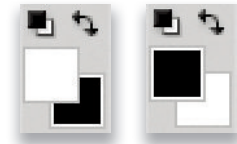
Figure 3.33 Setting the foreground color to black will darken the image while white will lighten. To toggle back and forth between the colors be sure to reset the colors then simply press the **X** key to toggle back and forth.



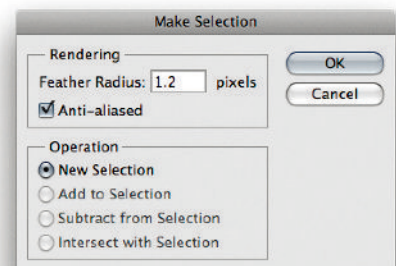
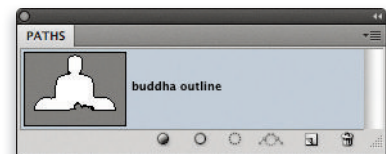
2 To allay my natural fear of painting, I started the process by making a luminance selection of the darker areas I wanted to enhance (to load the luminance as a selection hold the **Ctrl** key and click on the RGB channel). Since the 50% gray layer was set to 100% opacity, I needed to work gently and set the brush flow to only 5%. Much of the subsequent work was actually done with the flow set to 1–3%. I started painting into the selection using white as the foreground color. I also inverted this selection and painted with black to increase the separation between the areas. I used the **X** key to toggle back and forth between painting with black or white as shown in Figure 3.33. Lightening an area tends to visually make it move closer while darkening makes it recede. Thus by lightening and darkening adjacent areas I could increase the appearance of dimensionality.



3 In this step I zoomed into the image and painted white into the chin area and black under the lips to give a greater sense of depth and separation. As long as you work with a very low flow and build up the strokes, you don't need to worry about being too accurate with each stroke.

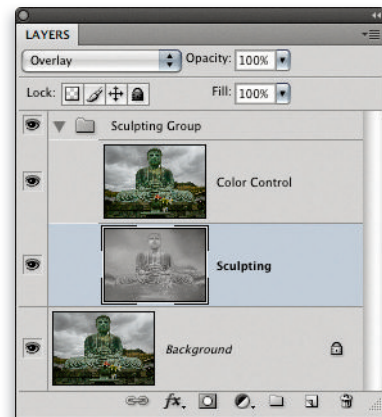
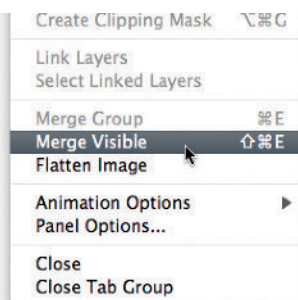
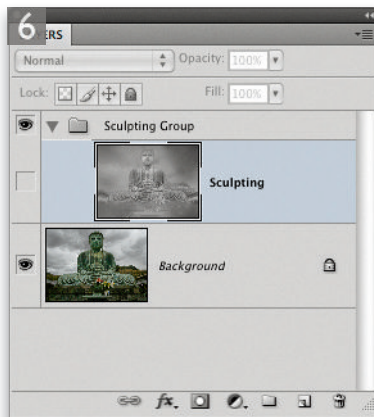


4 Not everything I needed to do could be done with a synthetic selection or by freehand painting. In this step I created a path to outline the Buddha and then made a selection from the path. The 1.2 feather radius was used to approximate the resolution of the edges in the image. If the selection was too sharp it would look like a cut-out and if too soft it would bleed the effects. A 1.2 feather radius matched the sharpness of the natural edge. By inverting the selection I could work on the sky or, by inverting again, work on the Buddha.





5 In the top figure I had inverted the selection to paint black to darken the sky beyond the Buddha's head. In the bottom figure I had reinverted the selection (to reselect the Buddha) and painted with white to lighten the shoulder.



6 One of the inherent problems with using an Overlay blend mode to sculpt an image is that when increasing the contrast of an image, you may also get a boost in the color saturation. To control that I created a merged layer set to Color blend inside a layer group. I deselected the Overlay layer and held the **alt** key when selecting the Merge Visible option in the Layers panel. Placing the Color Control layer above the Overlay layer essentially removed the color saturation boost. I didn't bother with a layer mask for the Sculpting layer because it was really easy to get rid of the black and white in the layer by changing the foreground color to a 50% gray and painting or filling to reduce the effect of the layer.





7 This step shows the result of painting white and black in the various areas to alter the dimensionality of the final image. You'll see that the effect of adding black and white to the Sculpting layer is fairly subtle — as it should be.



8 Here is the final result. The original image of the Daibutsu Buddha in Kamakura, Japan, was shot with a Canon EOS 1Ds with a 16–35 mm F2.8 lens.

Photomerge quality

Of course, all this is assuming that Photomerge in Photoshop is any good. When Photomerge first appeared in Photoshop CS, a lot of us got quite excited by this new feature, although truth be told, to achieve successful results you needed to shoot really carefully and not use too wide a lens. Photoshop CS4 saw a major improvement in Photomerge functionality, allowing you to merge wide angle and even fisheye lens images. Photoshop CS5 has seen a further fine-tuning of the Photomerge processing to the extent that Photomerge will work well with most types of lens as long as you provide sufficient overlap between each capture image.

Photomerging images to improve quality

Unless you are willing to carry a complete series of camera lenses with you wherever you go, you are often going to find yourself in situations where you are missing the right lens. This isn't such a problem if you need a long focal length lens, since you can always crop the image more tightly. However, if it is a wide-angle lens you want, your only option is to use a stitching technique such as the method shown here in Figure 3.34, where Photomerge was used to blend a series of shots together to create a wide-angle type view.

Although it is a time-consuming and cumbersome process to capture and stitch a handful of photos together in this way there can be a payoff in doing so, as you may end up with a better quality image than if you had originally shot the photo using a wide-angle lens. To start with, if you shoot, say, six or more overlapping photos, you will most likely end up with a merged image where the pixel resolution is higher than the native resolution of the camera that was used to take the photos. Secondly, by splitting the captured image area into sections you avoid the problems of image detail falloff towards the edges of the picture. You see, with any lens the image quality will always be at its sharpest in the center and less sharp towards the corners. If you are shooting with a good quality lens this shouldn't be much of an issue, but with other lenses it can be. I say it can be, because this does also depend on how important it is to see perfectly sharp detail in the extreme corners of an image. The point I am making here is if you are forced (or choose) to create a wide-angle view through combining a series of captures using Photomerge to produce such a view, there may be some benefits in taking this approach.

In the Figure 3.34 example, I was on a forest trek where I had hoped to photograph the wildlife, but instead came across this bilbao tree and its amazing, above-ground root structure. The widest lens I had was a 70 mm on the 70–200 zoom, attached to the Canon 400D camera. I photographed it using a series of 12 shots and stitched the images together using Photomerge to produce the wide-angle view seen here. The combined image had a resolution of 6600×4800 pixels compared to the 3888×2592 native resolution of the 400D. As you can see in the close-up view, the detail in the top left corner was sharper than one would expect from an enlarged single photo shot using a wide-angle lens.



Figure 3.34 This shows the segmented view (top) of a Photomerge image and below, the final image.

Improving the shadows with Merge to HDR Pro

The Merge to HDR Pro feature is explained in more detail in Chapter 9, plus there is also a PDF extract on the DVD taken from the *Adobe Photoshop CS5 for Photographers* book that is all about working with the merge to HDR Pro feature. I briefly mention HDR imaging here because merging bracketed exposure images together to create a high dynamic range master is a useful thing to do since a low dynamic range image that is rendered from an HDR master will allow you to obtain improved shadow detail with smoother tones and without banding (see Figures 3.35 and 3.36).



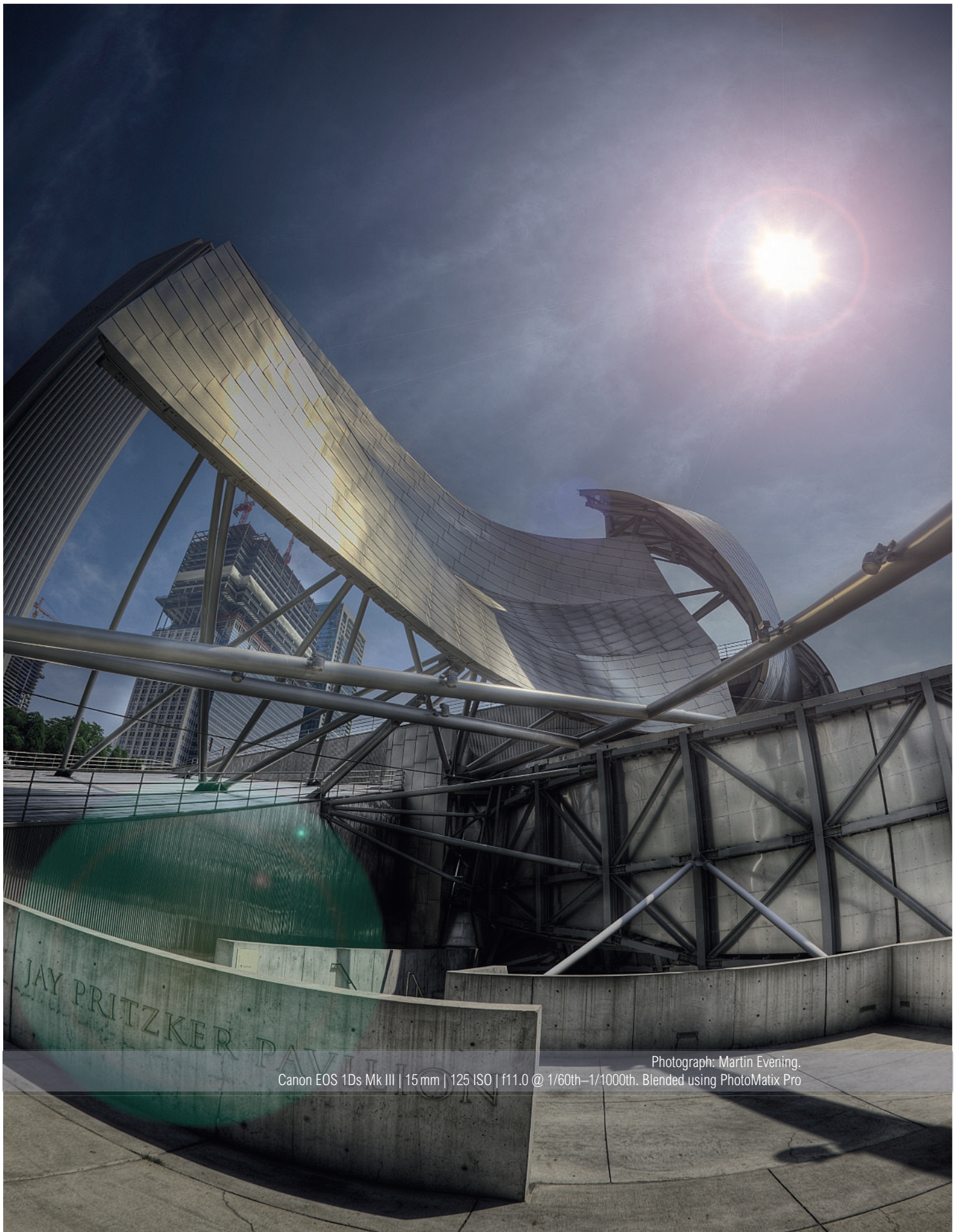
Figure 3.35 Here you can see an example of a raw image that was processed using Camera Raw 6 and Process Version 2010 to produce the best image quality and tone balance possible from a single raw image. The close-up view has been lightened in order to reveal how there is image noise and banding visible in the extreme shadow areas.



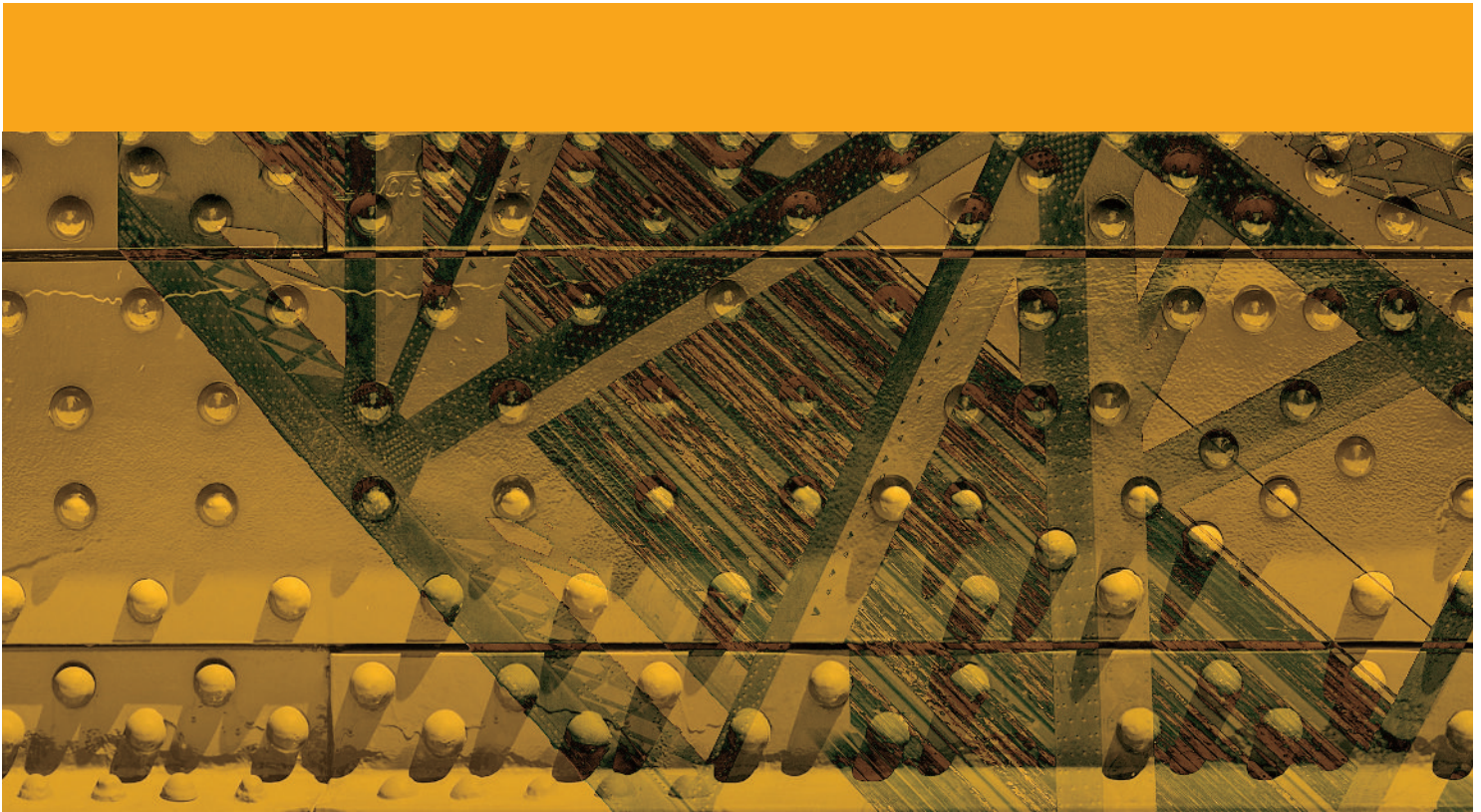
Figure 3.36 In this example I used three bracketed raw images shot at +2 and -2 EV around the image exposure shown in Figure 3.35 and used these as the source files to create the Merge to HDR Pro image shown above. The aim here was to produce as close a result as possible to the Figure 3.35 version. As you can see in the lightened close-up view shown here, there is no noticeable noise or banding visible in the shadow areas of the Merge to HDR Pro image version.

Overexposing the shadows

This technique works because the Merge to HDR Pro image makes use of the overexposed bracketed exposure to define the darkest shadows. You may already be aware that there can be a significant drop-off in quality in the shadow areas of a normal exposed image relative to the brighter areas and this is one reason why the experts are inclined to advocate 'exposing to the right'. With HDR images you should have many more levels of tone detail information to work with in the shadows and this is why the shadows look better.



Photograph: Martin Evening.
Canon EOS 1Ds Mk III | 15 mm | 125 ISO | f11.0 @ 1/60th–1/1000th. Blended using PhotoMatix Pro



Chapter 4

Mending and blending

Photoshop repair work

Most people tend to think of Photoshop as a program for retouching photographs. Of course, Photoshop can do a lot more than that these days, but retouching is what the program is best known for. In this chapter we wanted to focus on a few of our favorite retouching techniques. Some of these are quite involved and require a certain level of expertise, while others are actually quite simple and provide some interesting shortcuts for correcting photos.

Healing brush modes

The healing brush offers a choice of blending modes. The Replace mode is identical to the clone stamp tool, except it allows you to merge film grain more reliably and smoothly around the edges of your brush strokes. The other healing brush blending modes can produce different results but in my opinion they won't actually improve upon the ability of the healing brush in Normal mode, since the healing brush is already utilizing a special form of image blending to perform its magic.

General retouching

Healing brush strategies

Those of you who have not used versions of Photoshop prior to version 7 must forgive us for thinking that the healing brush is a magical wonder, but it can't do everything. The clone stamp tool still has its uses, as does copying and pasting pixels. When to use what can be tricky – healing is best done away from strong contrast perimeters and where texture needs to be preserved (or added to). It's best used at full opacity and with a hard brush (just about the opposite of the clone stamp tool). Sometimes you need to seed an area with pixels before the healing brush can be made to work, other times it's better to use the patch tool where you can make an accurate selection prior to using the tool. Sometimes it is easier to simply grab pixels from some other source and blend them in. Figure 4.1 shows my Harley shot in the studio. There are issues: too narrow a background, wrinkles and a foreshortened foreground due to needing a front fill card. Figure 4.2 shows how the healing brush as well as the patch tool were used to fix these background issues. The Layers panel shows the addition of a pasted layer from a separate image shot on the same background. There are additional layers for tone adjustment and a fix for the Harley logo. The final retouched image is shown in Figure 4.3.



Figure 4.1 This is the before shot of my FLSTS Harley (I've sold that and ride a BMW now). You can see that the muslin background didn't cover the full width and is short in the foreground due to a required fill card. You can also see seams that need removal.

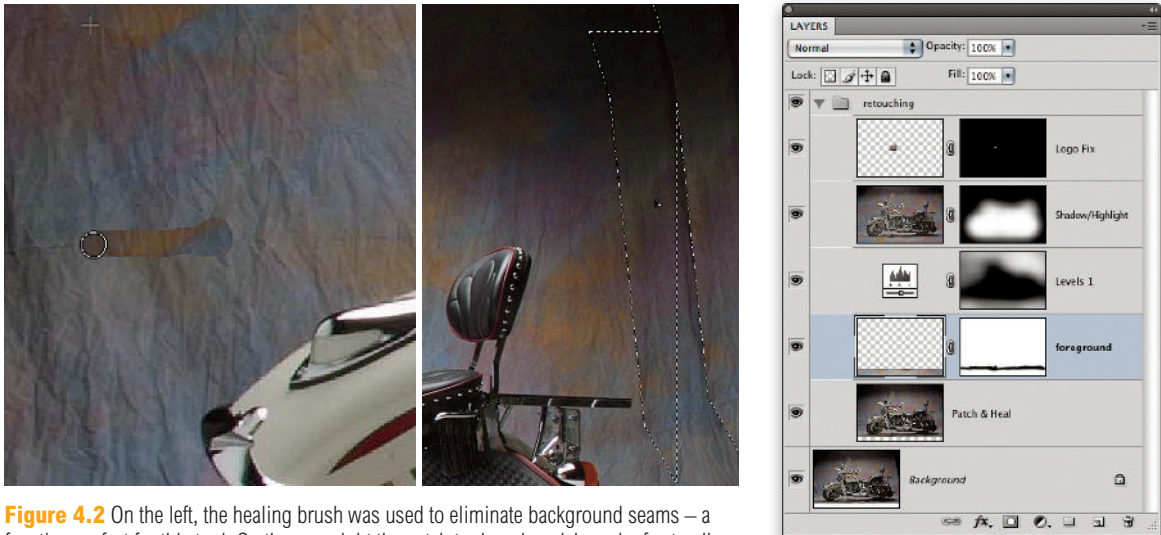


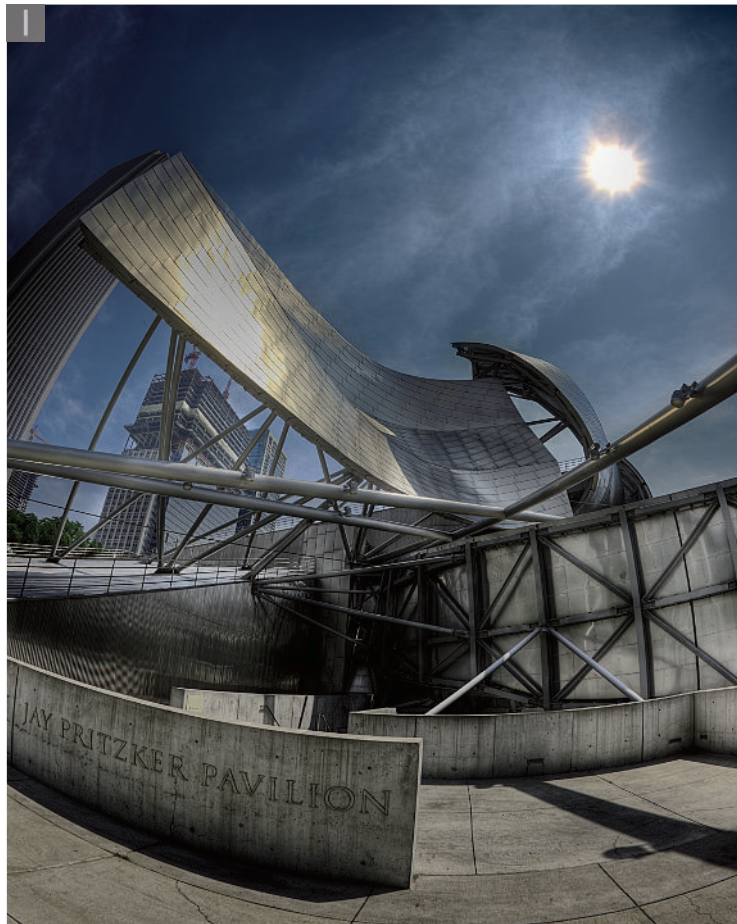
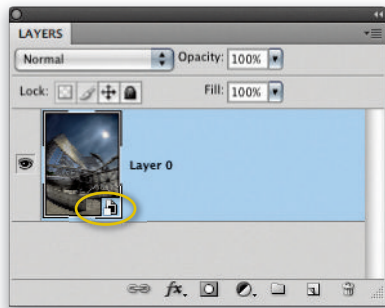
Figure 4.2 On the left, the healing brush was used to eliminate background seams — a function perfect for this tool. On the near right the patch tool made quick work of extending the background. On the far right is the final layer stack showing a foreground addition added from a separate shot to cover up the fill reflector card.



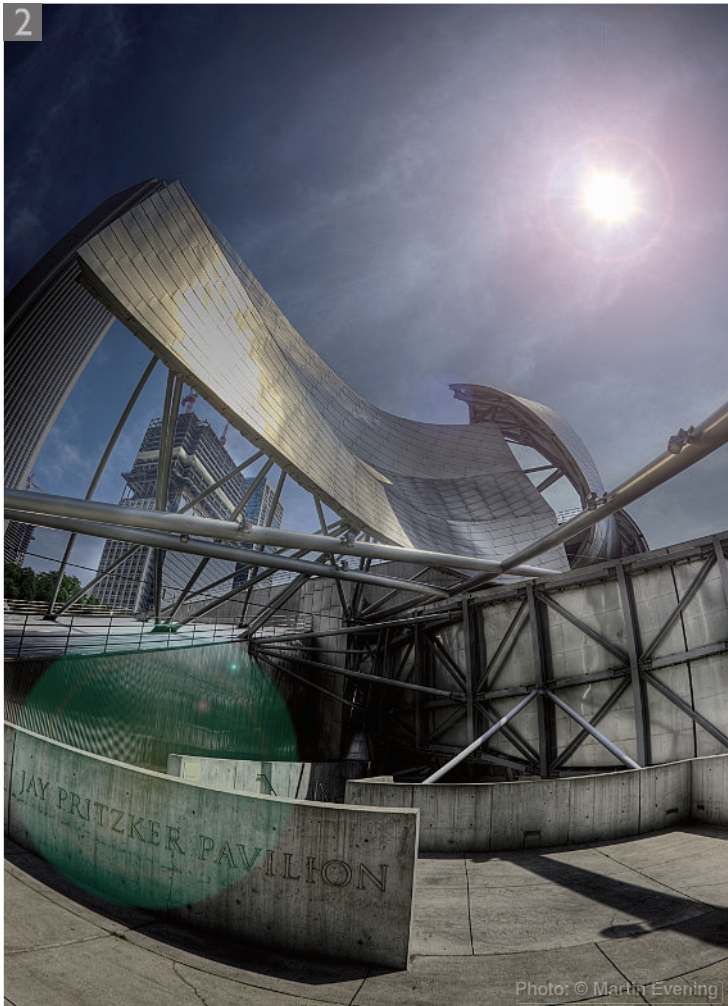
Figure 4.3 The final retouched image.

Adding lens flare

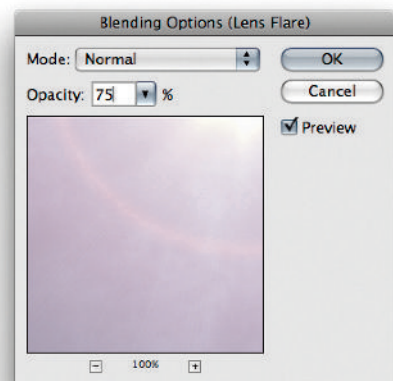
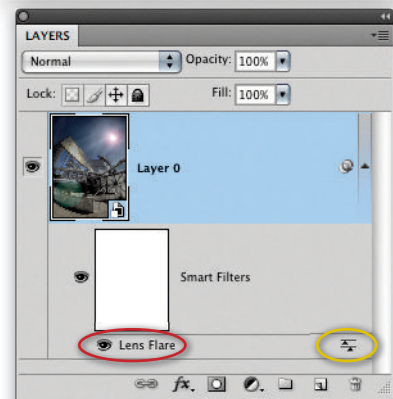
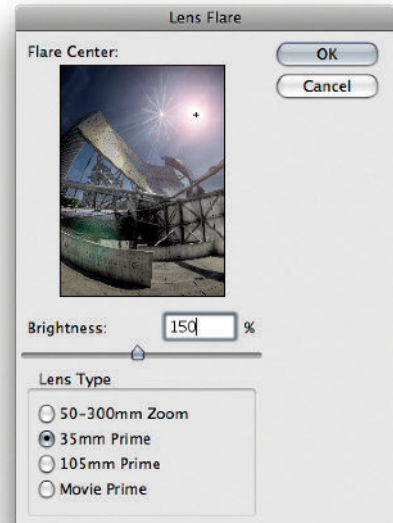
The Lens Flare filter is ideal for adding realistic-looking lens flare effects to photographs or computer rendered images, as this filter allows you to apply the ghosting type patterns that are normally associated with camera lens flare. Now that we have Smart Filters it makes sense to convert an image to a Smart Object layer first before you apply the filter. This way you have the ability to re-edit the filter settings and precisely reposition the source point for the lens flare effect.



1 Here is a before version of a photograph, shot into the sun using a series of bracketed exposures and blended together using Photomatix Pro. The first step was to select the Background layer, go to the Filter menu and choose Convert to Smart Filter. This converted the layer to a Smart Object – you can see the Smart Object badge circled in the Layers panel.



2 I then went to the Filter menu and chose **Render** ⇒ **Lens Flare...** This opened the dialog shown top right, where you will notice there are several different types of lens flare patterns that you can choose from. Since this photograph was originally shot using a 15 mm fisheye lens, I selected the 35 mm Prime option. I then clicked on the sun in the small dialog preview to set this as the flare center point. One can then adjust the Brightness slider to create a weak or strong lens flare effect. Since I was applying the effect as a Smart Filter I chose to set the brightness quite high at 150%. This allowed me to later edit the Lens Flare Smart Filter settings by double-clicking on the options icon (circled in yellow) next to the Lens Flare effect to open the Blending Options dialog shown here, where I could quickly fade the filter effect strength. The other advantage of applying as a Smart Filter is that I could double-click the Lens Flare effect (circled in red) to reopen the Lens Flare dialog and re-edit the filter settings (this is true for any filter that you are able to apply as a Smart Filter).

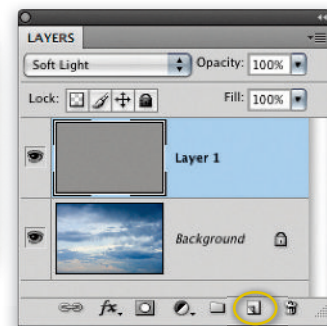
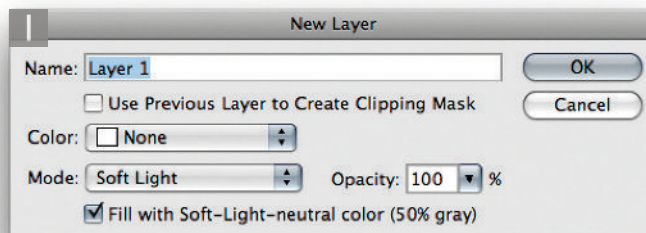



Alien Skin™ Exposure®

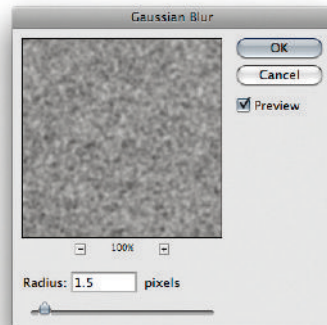
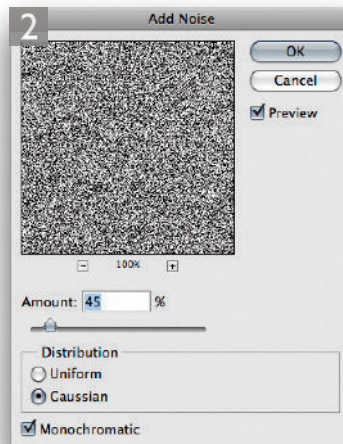
If you are after a good range of film simulation effects for digitally shot images, then check out the following link: www.alienskin.com/exposure/ This Photoshop plug-in can be used to apply film grain effects that match a variety of traditional film emulsions.

Simulating film grain

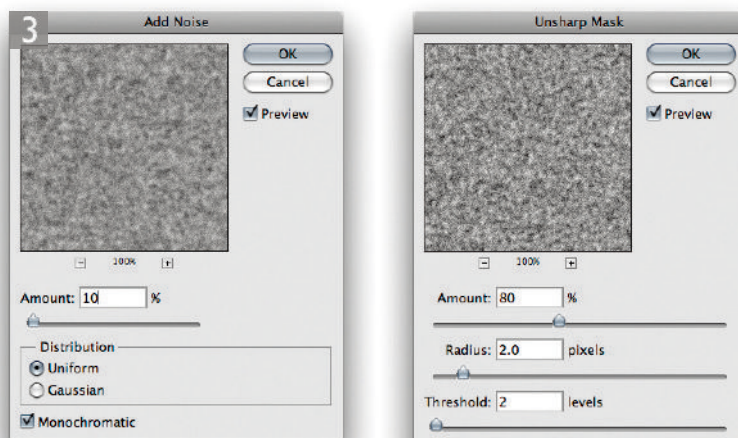
Most Photoshop users will be aware that you can use the Add Noise filter to get images to look more grainy, but the Add Noise filter will always tend to look rather ‘electronic’ if it’s applied as a single filter. The following steps show one way you can modify the Add Noise filter effect to achieve a result that looks more like real film grain. For example, this technique might be used to simulate a grainy film look or to disguise retouching work that’s been carried out on a scanned film image.



1 The first step was to  **alt** click the Add New Layer button in the Layers panel (circled). This popped the New Layer dialog shown here where I set the blend mode to Overlay and checked the ‘Fill with Soft-Light-neutral color (50% gray)’ box.



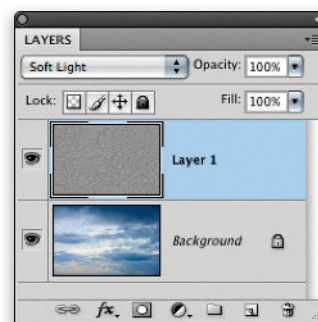
2 With this new layer selected, I went to the Filter menu and chose Noise ⇨ Add Noise. Here, I selected the Gaussian mode, checked the Monochromatic box and applied an Amount of 45%. I followed this by going to the Filter menu again, selected Blur ⇨ Gaussian Blur and applied a 1.5 pixel Radius Blur.



3 I then applied a further dose of the Add Noise filter but this time added a lesser Amount of 10%, using the Uniform option, but still in Monochromatic mode. Lastly, I chose Filter ⇒ Sharpen ⇒ Unsharp Mask using the settings shown here.



4 In this final step you can see on the left the untreated image and on the right the same image with the film grain layer active. As you can see, the film grain steps described here can produce a very pronounced film grain effect, which can be made softer by either reducing the opacity of the film grain effect layer or modifying the filter settings that were applied in the previous steps.



Knowing how much grain to add

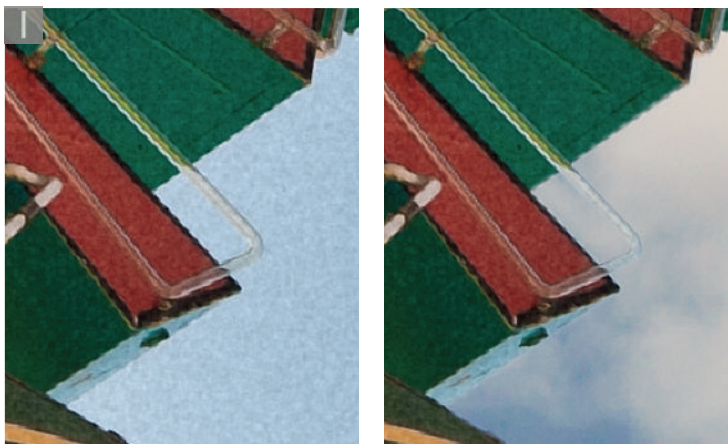
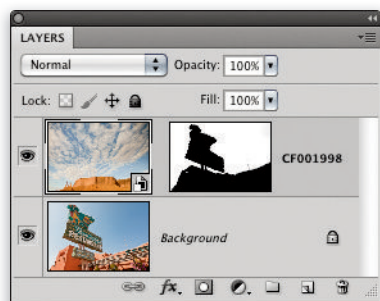
Remember, what you see on screen has little bearing on how the image looks when seen in print. The applied grain will therefore need to be quite strong for any apparent effect to be noticed in the printed image. To this end it may be worth printing out a series of differing amounts, possibly in the form of a test strip across the intended area to discover which settings work most effectively in print.

Matching grain

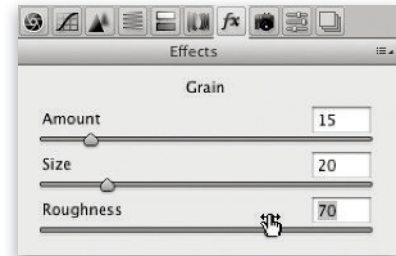
Digital artists who are accustomed to creating multi-image composites know that combining images from different formats or ISO settings can be problematic because of mismatched grain (or noise). Reducing the grain or noise in a capture or scan will often only partially mitigate the issue. You may also need to add a touch of grain to the image that is too smooth. While there are third party plug-ins and Photoshop tricks to add grain, perhaps the most efficient method to use now is Camera Raw's Grain tool in the Effects panel. The two images in Figure 4.4 show examples of mismatched formats and ISO. Figure 4.5 shows the final composite.



Figure 4.4 On the left is a digital capture from a Canon EOS Rebel XT_i at ISO of 800 (accidentally left high) and on the right a capture from a Phase One P 65+ medium format camera back at ISO 100. In order to composite the two convincingly, I had to add grain to the medium format digital capture.



1 The first step was to actually create a composite of the two images. The Layers panel (far left) shows the Phase One capture added as a Camera Raw Smart Object with a layer mask. The image above left shows the original shot's blue sky and the noise contained in the Rebel capture. The image on the right shows the new sky composite in place. The detail images are shown here at a 300% zoom setting in Photoshop.



2 With the Phase One Smart Object layer targeted, I double-clicked the Smart Object icon to open up the Camera Raw Smart Object window. The advantage of using a Smart Object is that one can make parameter changes without having to commit to those changes until flattening. The Grain settings I applied here were able to replicate the noise of the Rebel capture rather well. Generally, I prefer to use a low Amount, a relatively small Size and high Roughness to better simulate film grain. While primarily designed for raw captures, the Grain effects can also work for scanned TIFF images.



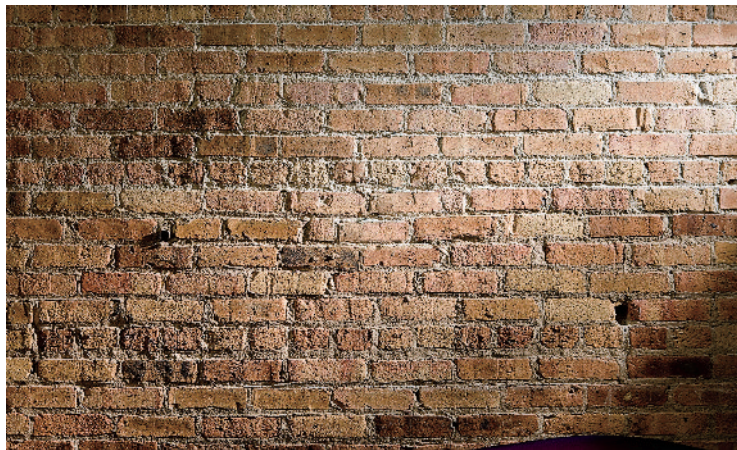
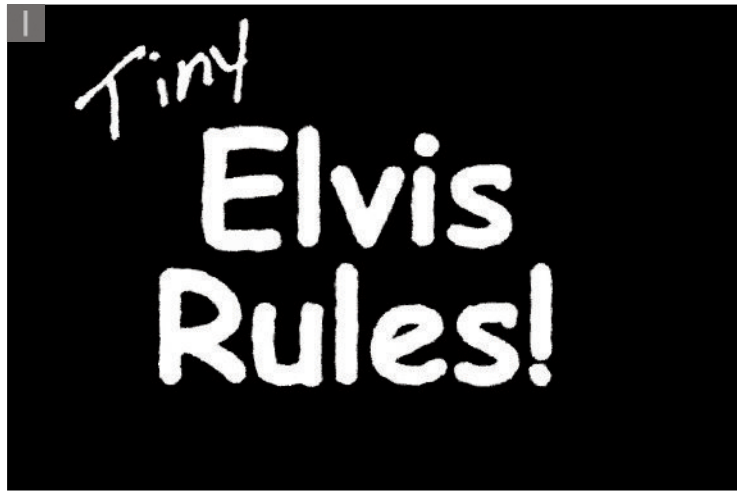
Figure 4.5 The final composite can't show the accuracy of the grain matching because of the small repro size, but take my word for it, the two images blended well.

Displacement maps

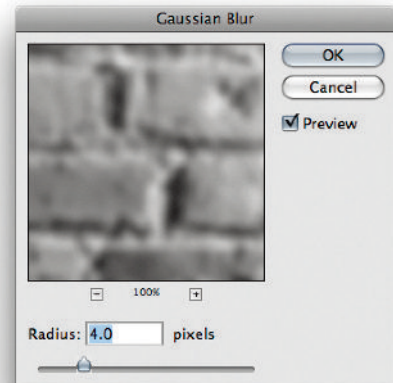
The Displace filter requires a separate displacement map image that it can reference when calculating the displacement. Black (0) will produce the maximum negative displacement shift and white (255) will produce the maximum positive shift, while gray (128) produces no displacement. A displacement map must be saved as a grayscale image using the native Photoshop file format, but if you add a second channel the first channel determines the horizontal displacement and the second channel controls the vertical displacement.

Merging objects with displace distortion

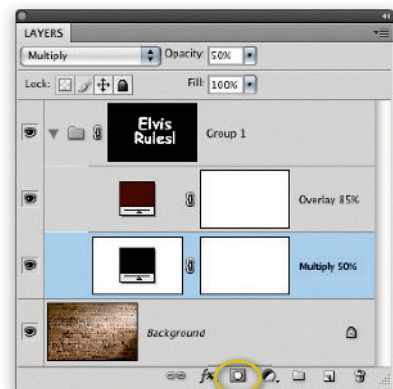
The Displace filter is not the most intuitive of filters but is still quite invaluable if you need to distort a layer so that it appears to match the shape or texture of the underlying layers. The effect works well where the displacement map you use has been softened beforehand, plus you will find a large number of displacement maps are contained on the Adobe Photoshop disk and these can be loaded to create other types of texture displacements.



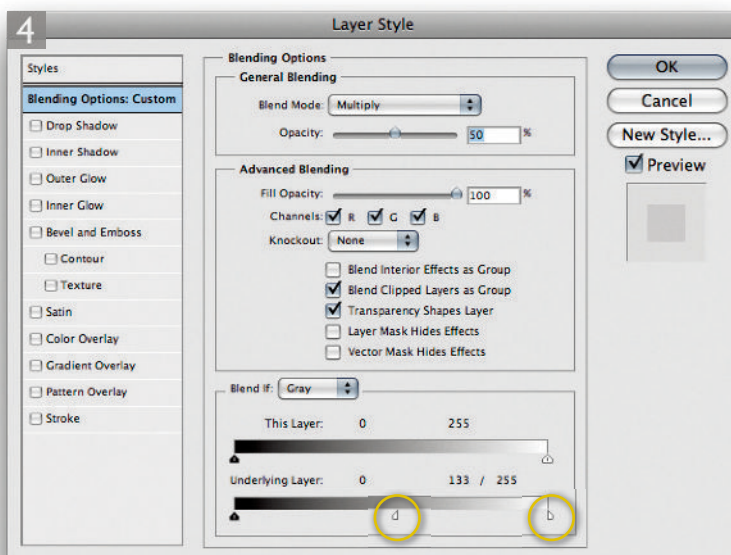
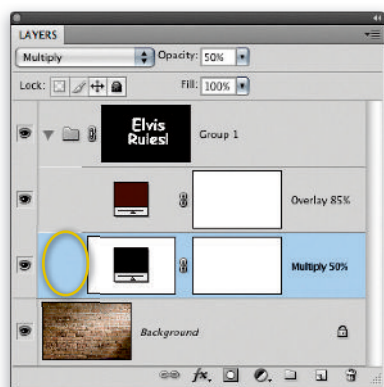
1 Here you can see the graffiti graphic and a brick wall image. To begin with I used **⌘ C** **ctrl C** to copy the graffiti logo pixels. I then went to the brick wall image, created a new channel and pasted the logo into the channel (**⌘ V** **ctrl V**). I duplicated the new channel and edited them both so that I ended up with the 'Elvis Rules' and 'Tiny' alpha channels.



2 The next job was to create a displacement map image for the Displace filter step. To do this, I went to the Image menu, chose Duplicate and converted the duplicated image to Grayscale mode. I then applied a 4 pixel Gaussian Blur filter and saved this image to the desktop (where it would be easy to locate later). It is important to note that when you create a displace filter map the image must be in grayscale mode and saved using the native Photoshop (PSD) file format. It is also very important to delete the two additional alpha mask channels seen in Step 1 before saving.



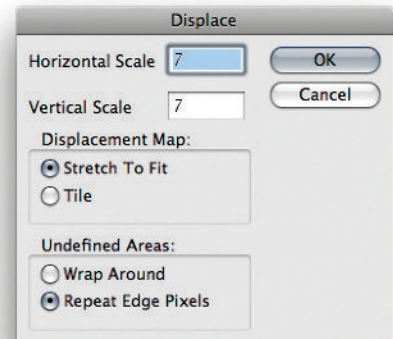
3 I was now ready to blend the two elements together. Here I created a new layer group and added two solid color fill layers inside it. One used black as the fill color, where I set the layer blend mode to Multiply at a 50% Opacity. I used a dark brown for the other color layer and set the layer blend mode to Overlay and the Opacity to 85%. Next, I **ctrl**-clicked on the Elvis Rules alpha channel in the Channels panel (see Step 1) to load this as a selection. I then selected the layer group shown here and clicked on the Add layer mask button at the bottom of the Layers panel (circled) to convert this to a pixel layer mask for the layer group. As you can see, I now had a single layer mask that masked the two Solid Color fill layers. The graffiti didn't look particularly realistic yet, but I was about to work on that in the next step.



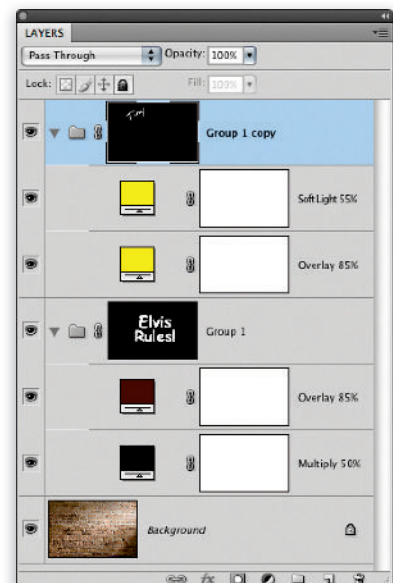
4 To get the lettering to look more graffiti-like, I needed to edit the Blending options for one or more of the Solid Color fill layers. For this particular image, I selected the black Solid Color fill layer that's highlighted in the Layers panel and double-clicked the layer, targeting the area you see circled here. This opened the Layer Style dialog, where I adjusted the underlying layer Blend If sliders (circled) to allow some of the mid to highlight tones to show through from below.



5 This shows how the graffiti design looked after I had modified the layer blending sliders for the underlying layer in Step 4. All I needed to do now was to distort the lettering so that it appeared to merge more realistically with the Background layer.



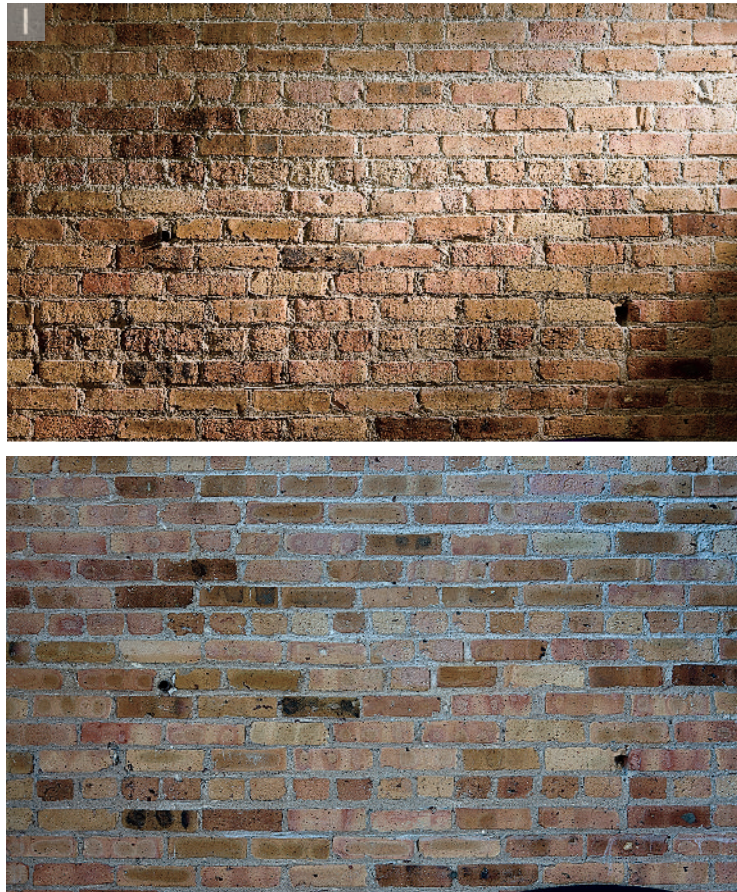
6 I selected the layer mask for the layer group and made sure it was correctly targeted. I then went to the Filter menu and chose Distort ⇒ Displace... The Displace dialog allowed me to set the displacement amount for the horizontal and vertical axes. You don't always want to enter too high amounts here. Start off with 10 and try redoing the displacement again using higher or lower values. In this instance the Displacement Map settings didn't make any difference because the pixel dimensions of the map I was about to use matched the image exactly. After I clicked OK in the Displace dialog, I was asked to locate a displacement map image file. This is where the saved grayscale image came in. I located the grayscale map that had been saved earlier to the desktop and clicked Open to use this as the displacement source image.



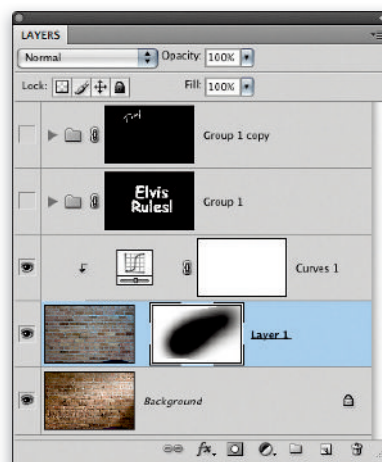
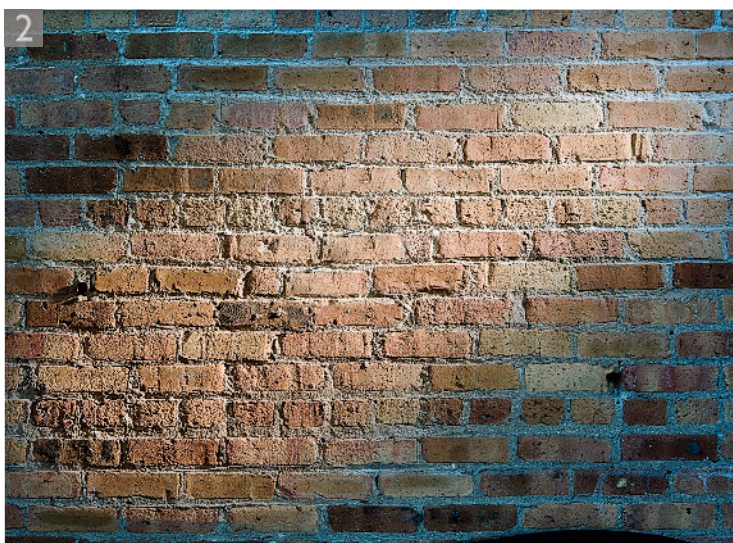
7 Here is the finished result, where the Elvis Rules logo was now distorted to match the shape and texture of the wall. You'll also notice how I added two yellow solid color fill layers and placed these in a new group, masked by the 'Tiny' alpha channel mask. I set one color fill layer to Overlay at 85% and the other to Soft Light at 55%, and applied the same Displace filter settings and displacement map to this layer mask.

How to create a spotlight effect

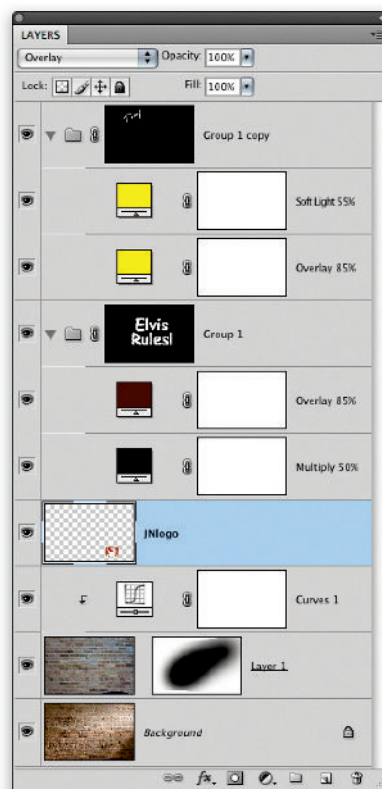
As we pointed out at the beginning of this book, although there is a lot you can do in Photoshop to retouch pictures and generate realistic-looking effects, it can still be useful to do extra work in-camera before you take the photographs into Photoshop. In the example that's shown here, I anticipated needing to light the wall in two different ways so that I could later combine these two captures to create a dramatic spotlight effect. The following steps show how I added a final twist to the 'Tiny Elvis Rules' image.



1 Shown here is the wall image lit with a spotlight (top), which was used as the backdrop image for the previous steps (as well as to create the displacement map image), and below that another shot taken of the same wall, but lit using soft diffuse lights that were filtered with blue gels to produce a soft shadow lighting look.



2 I dragged the soft lit wall image across to the layered master image, with the **Shift** key held down, so as to place it in register with the spot lit layer below. I then added a layer mask and painted with black on the mask to create a focused spotlight effect. I also added a darkening Curves adjustment which was clipped to the soft lit wall layer.



3 Here, I've made all the other layers visible to show the completed image, where you'll notice I also added an extra logo layer in the bottom right corner (this offers a small clue as to Tiny Elvis's true identity!)

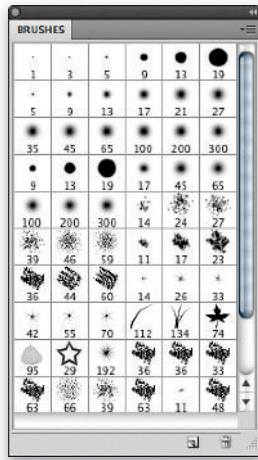
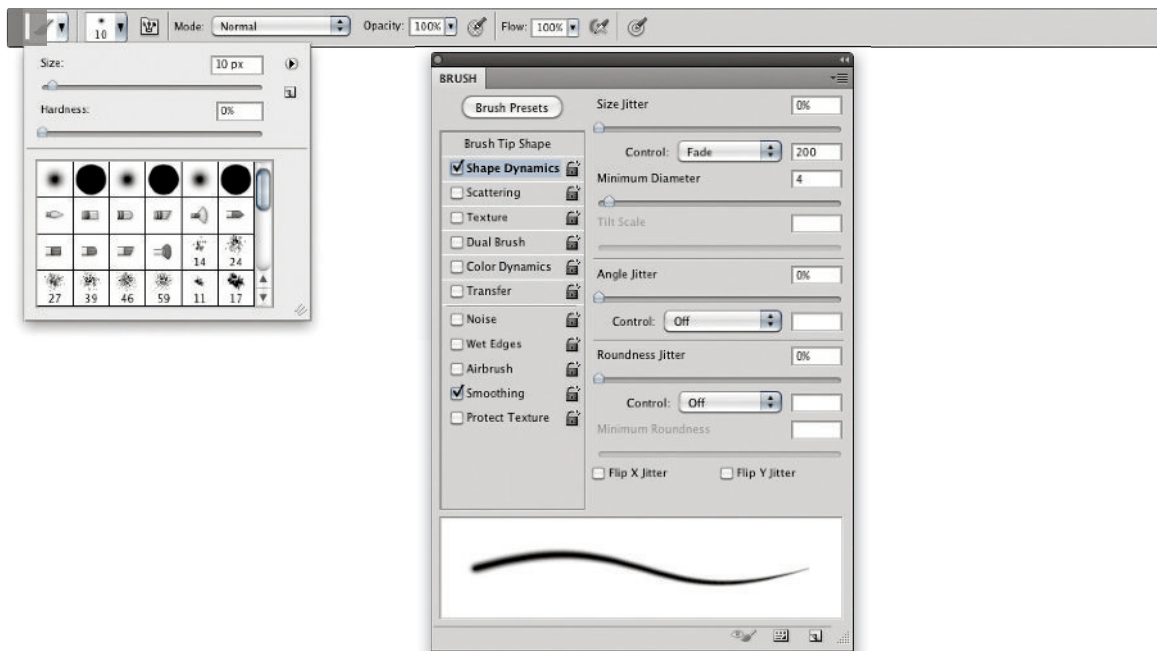


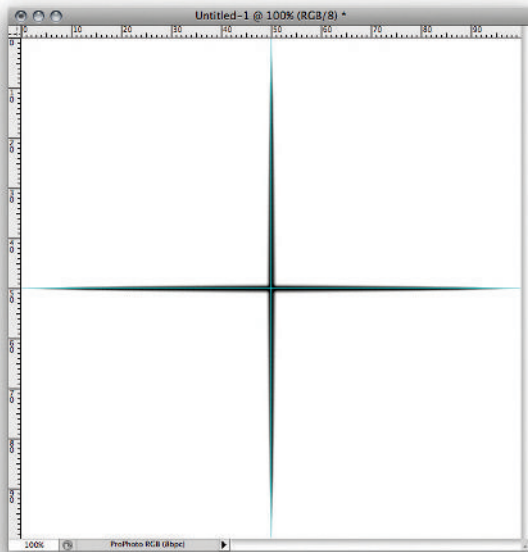
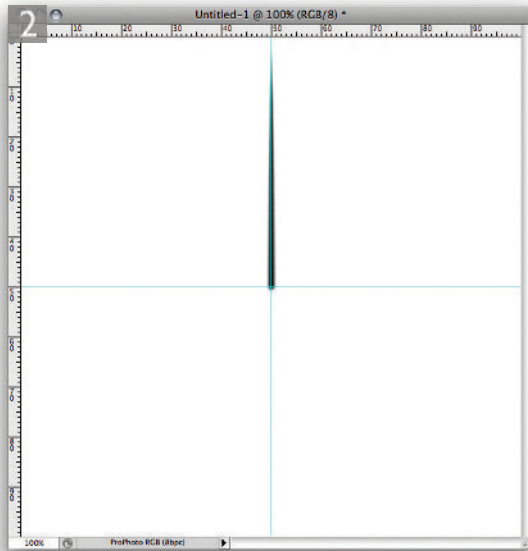
Figure 4.6 This shows the non-expanded, list view for the Brushes panel.

How to create a sparkle brush shape

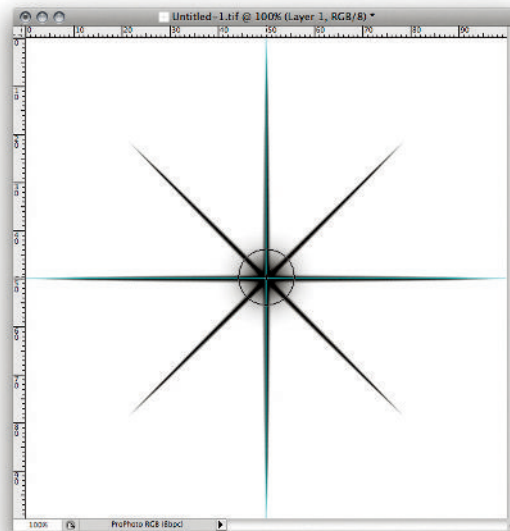
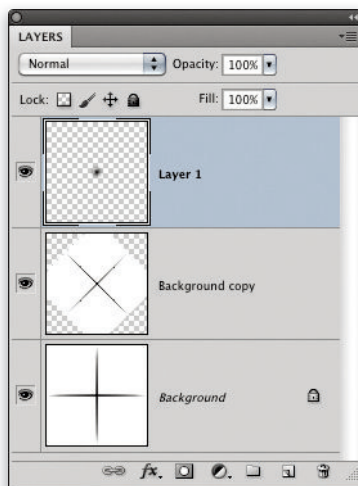
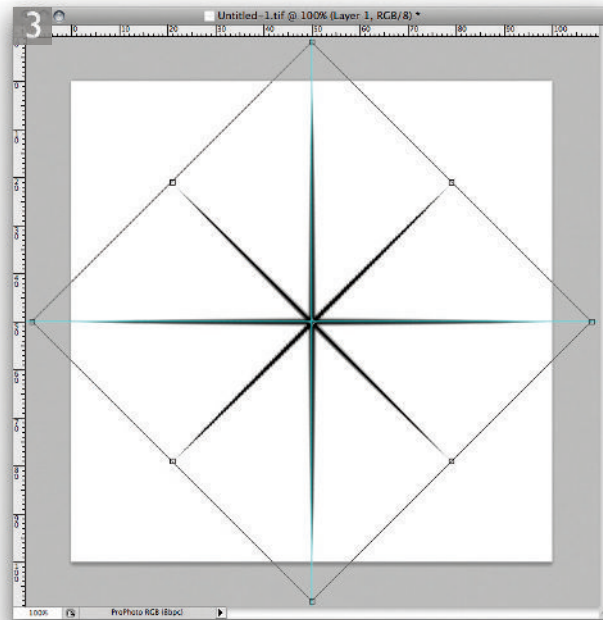
If you click on the Brush Presets item in the Brushes panel or view the Brushes panel in a non-expanded view (shown in Figure 4.6), you'll usually see a small thumbnail list of the different brush preset shapes that are available for use with the brush and other painting tools in Photoshop. You will also find even more brush presets can be loaded via the panel fly-out menu. However, if you want to, you can create your own custom brush preset designs by following the instructions shown here for creating a highlight sparkle brush preset. Once you name a brush preset, it will become appended to the current brush presets, but to make sure that the brush shape is saved permanently I suggest you choose Edit ⇨ Preset Manager, select the brush or brushes you have just created and then choose Save Set...



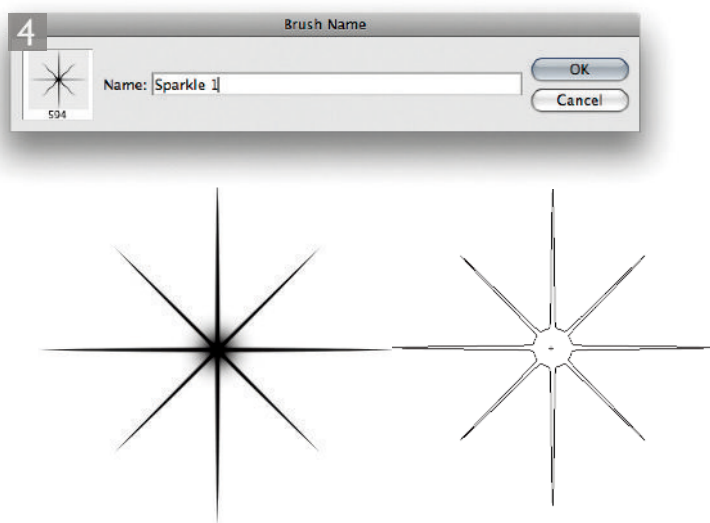
1 The first step was to go to the Options bar for the brush tool and select a small (10 pixel) soft-edged brush. I then went to the Brush panel and checked the Shape Dynamics, where I set the Control options to Fade and I also set the Minimum diameter to 4%. Having done that, I checked the brush preview shown at the bottom of the panel and returned to the Control options, where I adjusted the number of fade levels so that the brush preview smoothly tapered from a full size brush (on the left) to a minimum size brush (on the right).



2 I was now ready to create a new custom brush shape. To begin with, I created a new image document that was 600 x 600 pixels in size. I chose View ⇨ Rulers, double-clicked the ruler guides to set the units to Percent and added two guides at 50% on the horizontal and vertical axes. I then selected the brush tool (using the settings shown in Step 1), clicked on the center point, held down the **Shift** key and clicked at the top of the image. This drew the first line. I then repeated this step to produce the initial sparkle shape shown here.



3 I then copied the Background layer (**⌘ J** **ctrl J**), set the new layer blend mode to Multiply, went to the Edit menu and chose Free Transform. I rotated the layer 45°, scaled the transform to make the layer smaller and clicked **Enter**. I then increased the brush diameter to 70 pixels and clicked once on the center point using 100% opacity and 100% flow in the Tool options for the brush tool.



4 To create a new brush preset I first made sure that the guides had been cleared or were hidden. This is important, because you won't be able to create a new brush if the guides are visible. I went to the Edit menu and chose 'Define Brush Preset'. This opened the dialog shown here, where I gave the new brush a name and clicked OK. On the right you can see the brush cursor for the new 'Sparkle 1' brush preset.



5 Here is an example of the new brush preset in use, where I added a new layer to this shot of a diamond ring, and set the blend mode to Screen and the opacity to 62%. (Figure 4.7 shows the lighting set that was used for this particular shot.)

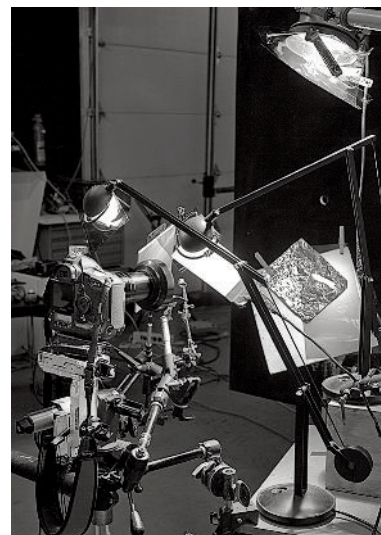
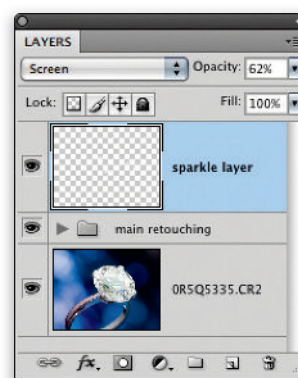


Figure 4.7 This shows the studio set that was used to photograph the diamond ring shown in Step 5. You will notice that the camera was mounted on a view camera support. This made it easier for Jeff to adjust the focus, because he could keep the ring and focus setting on the lens static and smoothly adjust the camera distance relative to the ring.

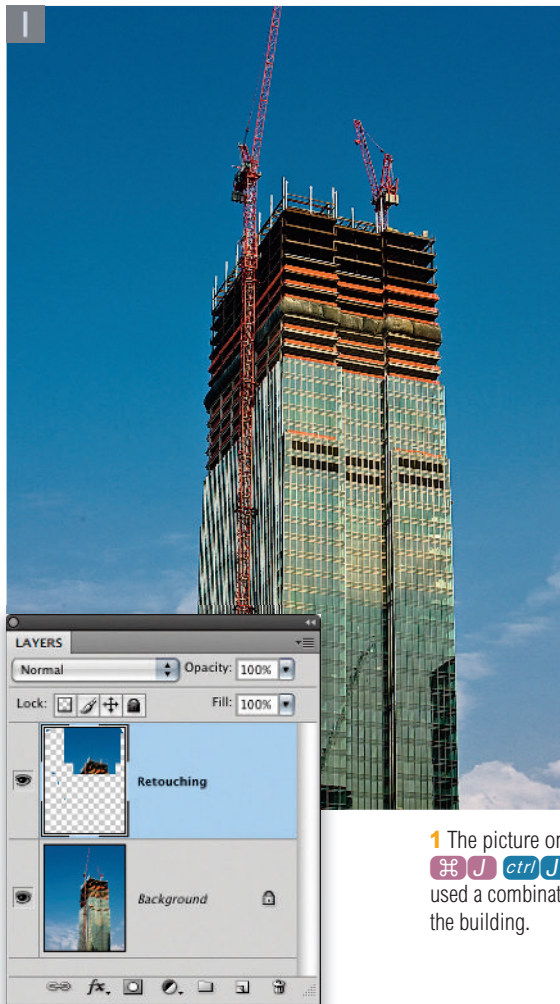


Sloping angles

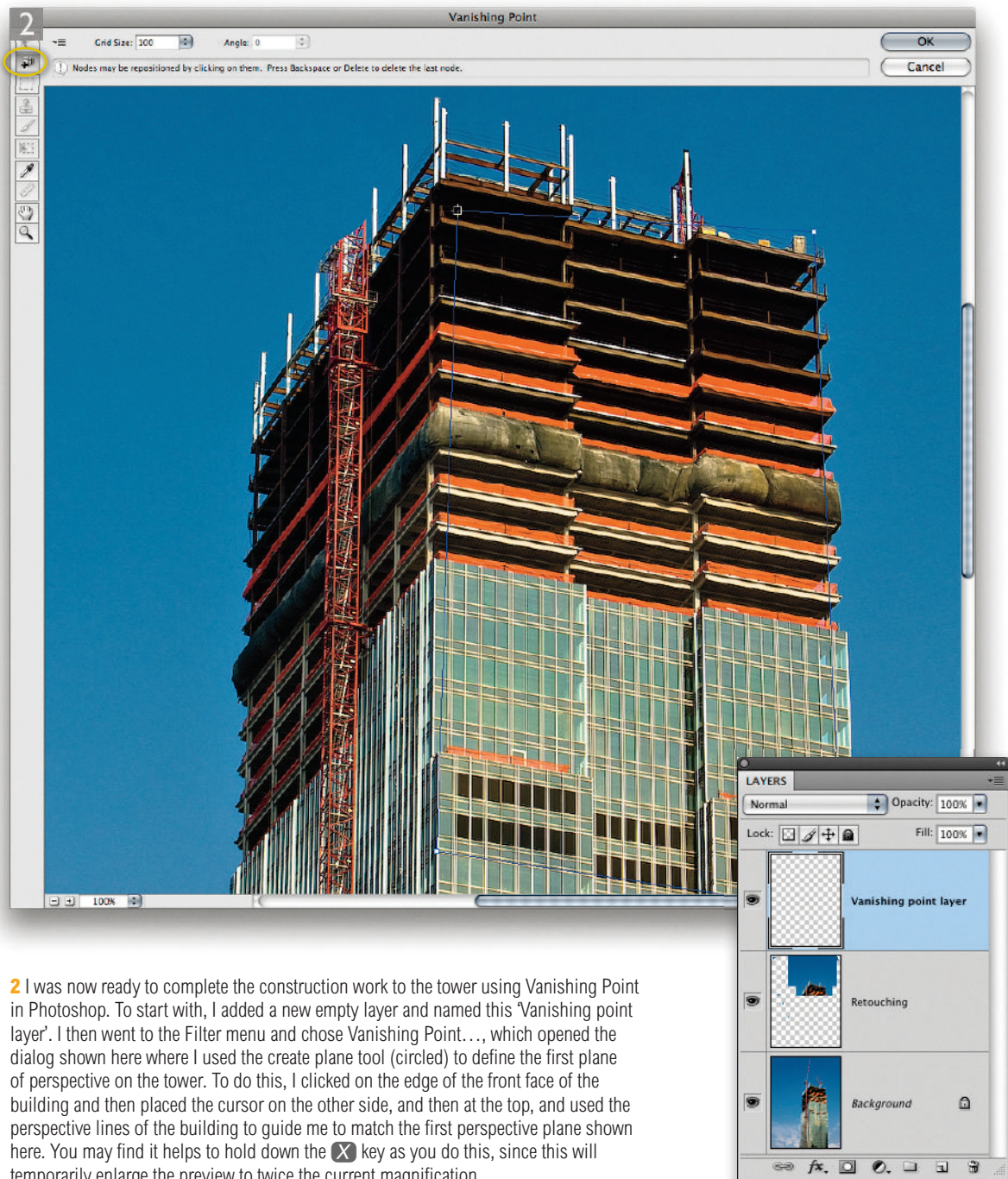
With Vanishing Point you can also drag off new planes using a custom angle. So long as you get the initial plane description completely accurate, you should find that the consecutive planes will match the remaining perspective planes in the scene.

Vanishing Point

The Vanishing Point filter provides a modal dialog in which you can define the perspective planes in an image and then use the tools available in Vanishing Point to carry out basic retouching work that matches the perspective of the picture. You can make a selection within the Vanishing Point preview area and clone the selection contents within one or more predefined plane areas. You can paste the contents of a selection and align it in perspective with the target image, plus you can apply the stamp tool in Healing or Non-healing modes, or paint with the paint brush in perspective.




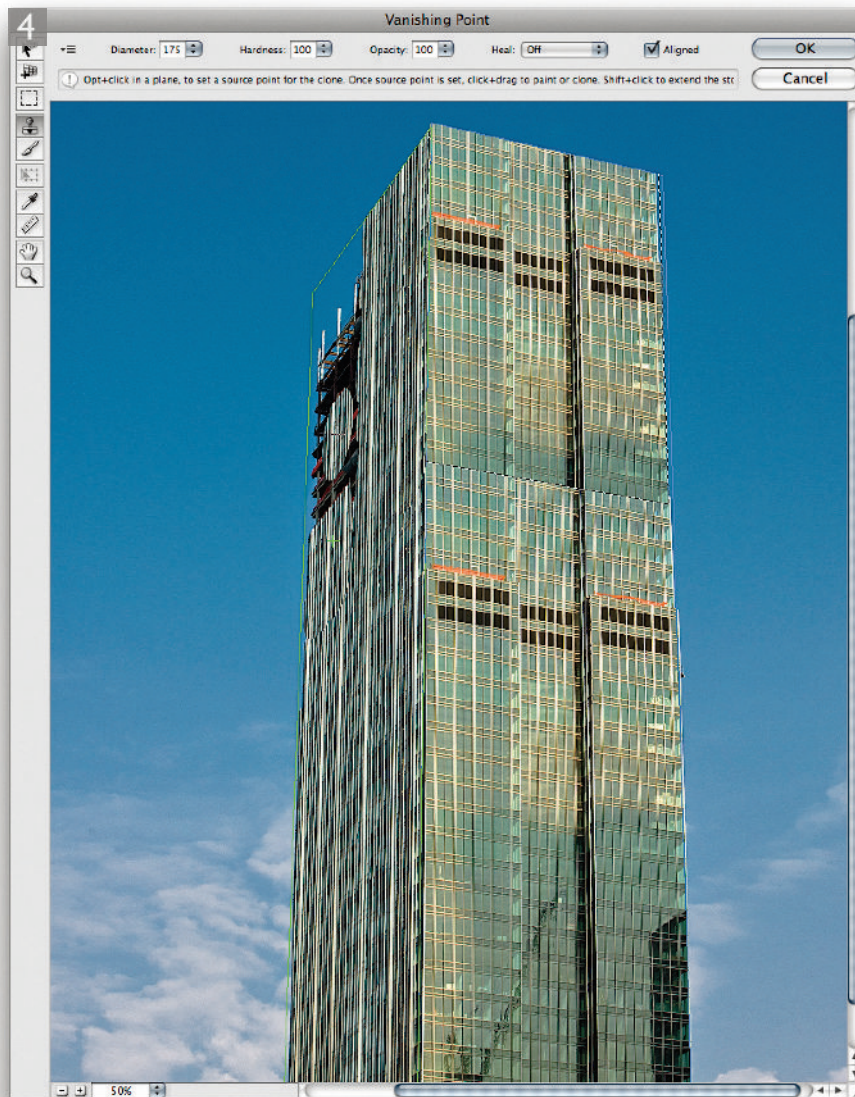
1 The picture on the left shows the original tower block photograph, where I used the **⌘ J** **ctrl J** keyboard shortcut to copy the top section of the tower as a new layer and used a combination of the clone stamp and patch tool to remove the cranes from the top of the building.





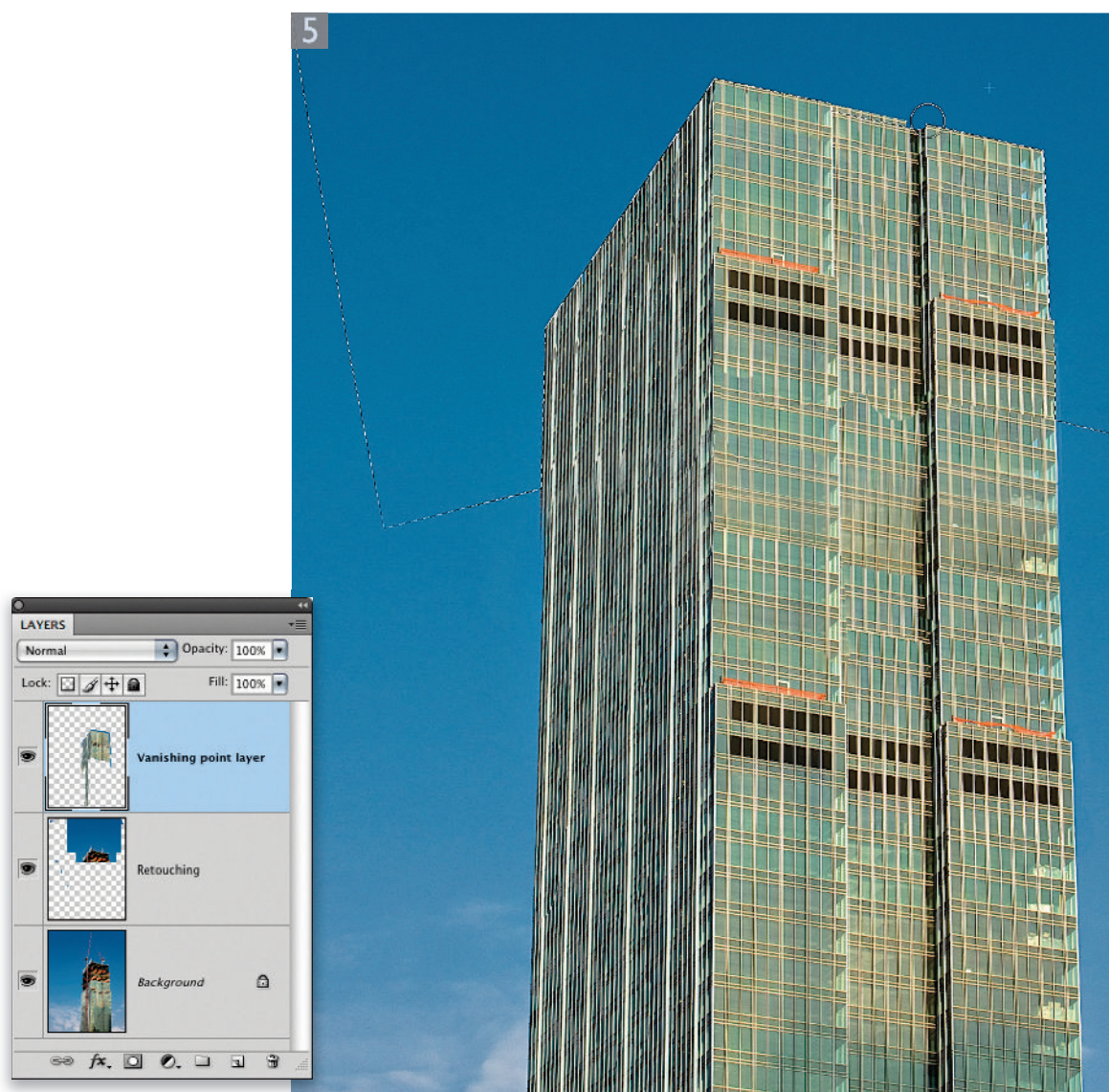
2 I was now ready to complete the construction work to the tower using Vanishing Point in Photoshop. To start with, I added a new empty layer and named this 'Vanishing point layer'. I then went to the Filter menu and chose Vanishing Point..., which opened the dialog shown here where I used the create plane tool (circled) to define the first plane of perspective on the tower. To do this, I clicked on the edge of the front face of the building and then placed the cursor on the other side, and then at the top, and used the perspective lines of the building to guide me to match the first perspective plane shown here. You may find it helps to hold down the **X** key as you do this, since this will temporarily enlarge the preview to twice the current magnification.



3 After I had defined the initial perspective plane I used the edit plane tool (circled) to fine-tune the placement of the plane handles. I find that in most cases it is necessary to edit the plane corners in order to match the perspective; this is especially important since how you define the first plane can have a significant impact on the other planes you create relative to the first. For example, in this screen shot I held down the  **ctrl** key as I dragged on the middle handle (circled in red) and dragged a new plane out from the first. Vanishing Point always understands how to create further planes based on the first plane that you draw. Once you drag a new plane out in the way that I describe here, it may not always match the second plane perspective exactly — in which case you can always edit the corner handles as necessary. However, if the second plane definition exceeds certain limits, the plane outline will first turn yellow and then red, and this will act as a kind of warning.



4 This screen shot shows the Vanishing Point retouching in progress. Here, I used the marquee selection tool in Vanishing Point to select the front side of the building and  **alt** -dragged to move a cloned copy of the selection further up the front of the building (matching the perspective). I then selected the stamp tool, adjusted the brush settings to get a hard-edged brush and, with the Heal mode switched to 'Off', I cloned sections of the building to cover up the crane scaffold and the unbuilt sections of the tower. The stamp tool works exactly the same as the clone stamp and healing brush in Photoshop itself: you use the  **alt** key to sample where to clone from, and as you can see, the stamp tool always shows an overlay preview.



5 This shows the photograph almost at the completion stage. I now needed to tidy up some of the outer edges. To do this, I used the pen tool to define a path outline for the outside area at the top of the building and then used the stamp tool to copy from parts of the sky to produce a clean outline.



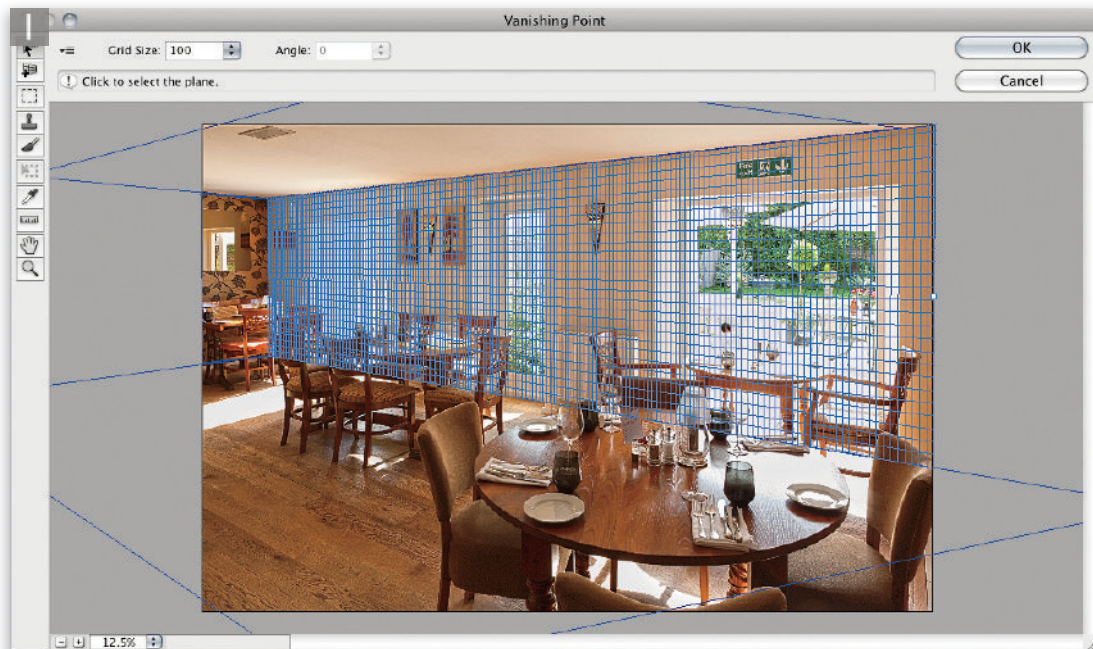
6 Here is the completed photograph, where I took the image into Vanishing Point one more time in order to clean up the joins on some areas of the building. To do this, I used a smaller sized stamp tool brush, which was again applied with the Heal options switched off.


Rendering options

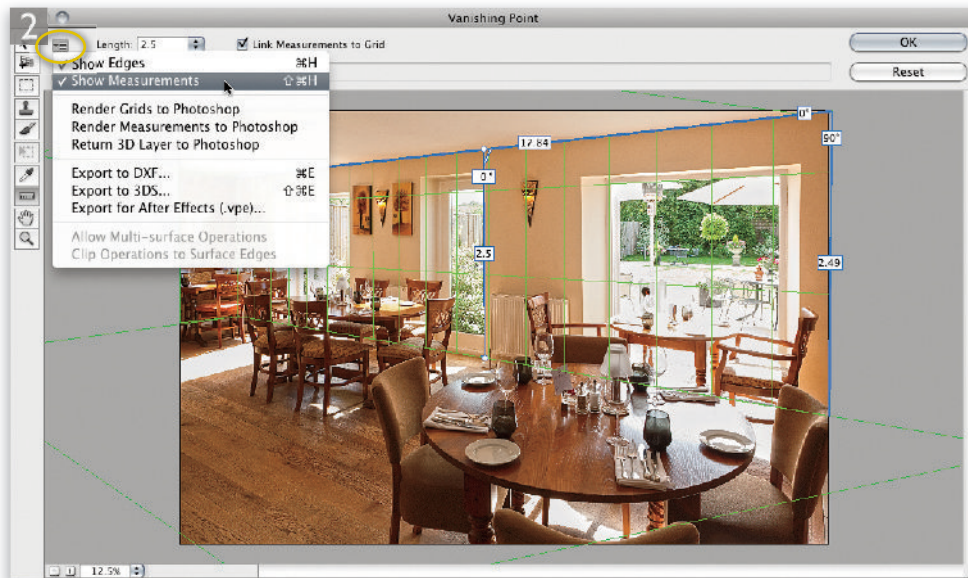
People have long asked for angled guides in Photoshop. With Vanishing Point, you can now create an empty new layer, launch Vanishing Point, use the create plane tool to create a perspective plane and go to the Vanishing Point options menu (circled in Step 2) and choose 'Render Grids to Photoshop'. This will draw the guides shown in the preview on the empty layer. Likewise, you can use the Render Measurements option to do the same with the recorded measurements.

Vanishing Point planes and measurements

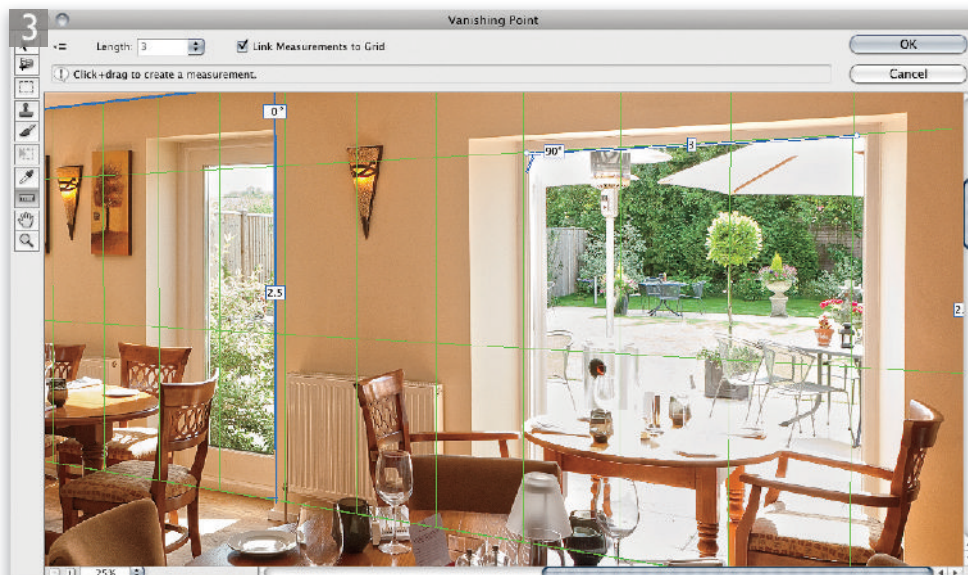
The following steps show a further example of how Vanishing Point can be used to edit a photo based on defined planes of perspective that have been first created using the create plane tool. If you happen to have the extended version of Photoshop, you can make a calibration measurement along a line on one of the planes and from this make further measurements of objects on associated planes. So for example, in Step 2 I was able to create a calibration measurement based on the known height of a room, and from that work out the distances and sizes of other objects in the room, such as the width of the door frame (see Step 3). Of course, the accuracy of the Vanishing Point planes and any subsequent measurements made is very much dependent on the degree of geometric distortion in the original photo. However, in Photoshop CS5 it is possible to correct for geometric distortion using the new improved Lens Corrections filter. Better still, if you are using Camera Raw 6.1 or later you can do so at the raw processing stage (see pages 58–61).



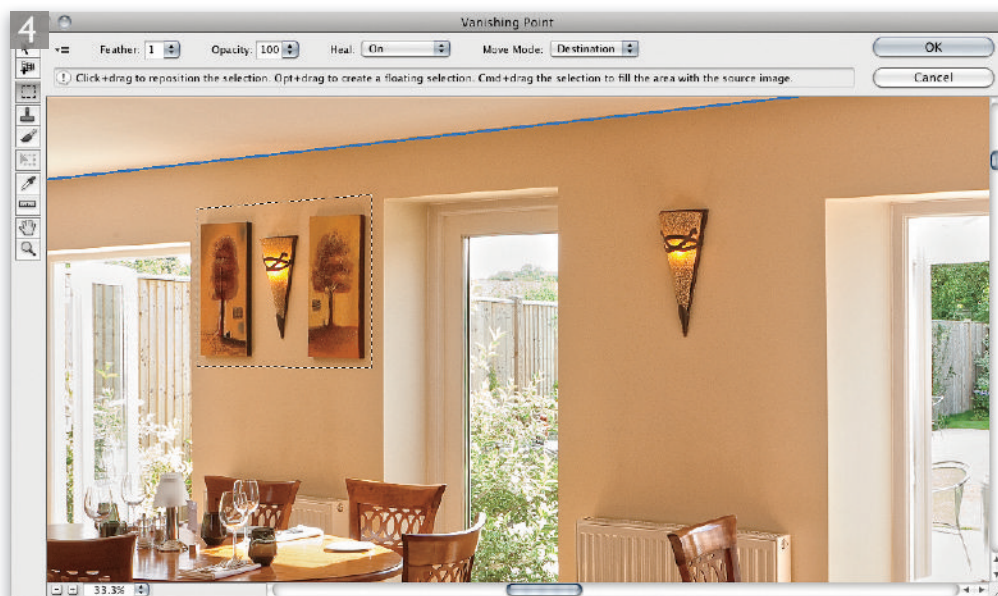
1 With Vanishing Point you can, as in the previous example, use the create plane tool to define the perspective planes for a photograph such as the room interior shown here. In this example I held down the  **ctrl** key as I dragged on the middle handle to create new planes that matched the perspective of the ceiling, floor and other wall.



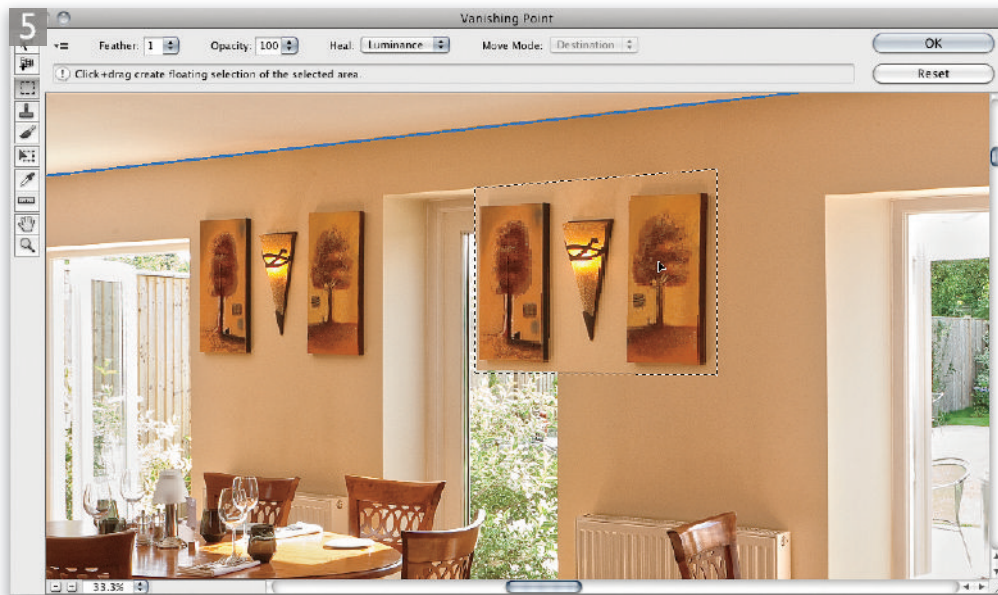
2 The measurement tool in Vanishing Point can be used to make comparative measurements in a perspective plane. Since I knew the height from the floor to the ceiling, I was able to select the measure tool and draw a measurement line along the vertical axis and enter a unit value (2.5 m) that corresponded with the known height of the room.



3 Once I had done that I could use the measurement tool to calculate other measurements relative to the first measurement (such as the width of the door frame).



4 With the perspective planes defined, I was able to use the marquee tool to make a selection of an area that I wished to clone in the image, while maintaining the correct perspective.



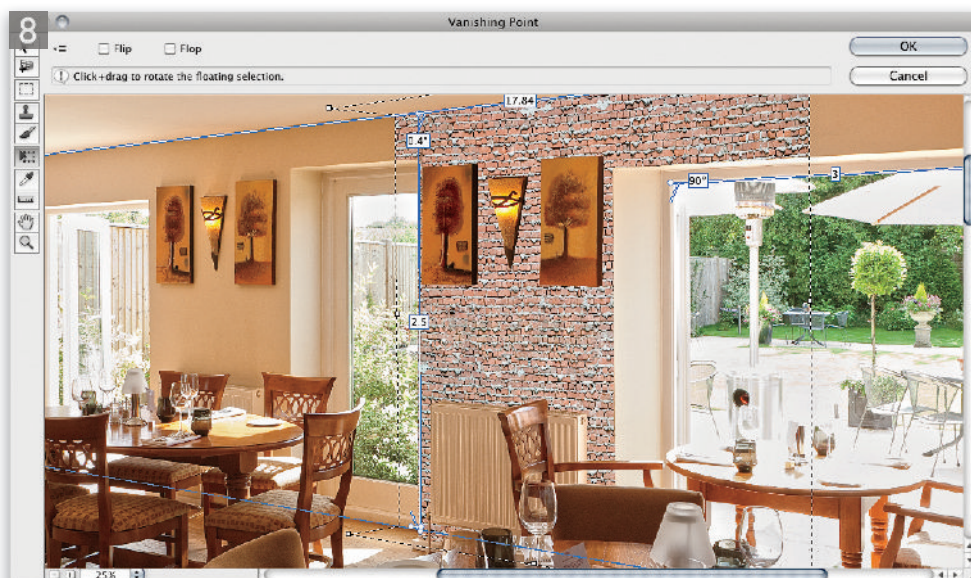
5 With the Heal option set to Luminance, I held down the **alt** key plus the **Shift** key and dragged the selected area to the right. Once I had the copied picture frames and lamp in position, I released the keys to place the cloned selection and clicked OK to apply these Vanishing Point edits.



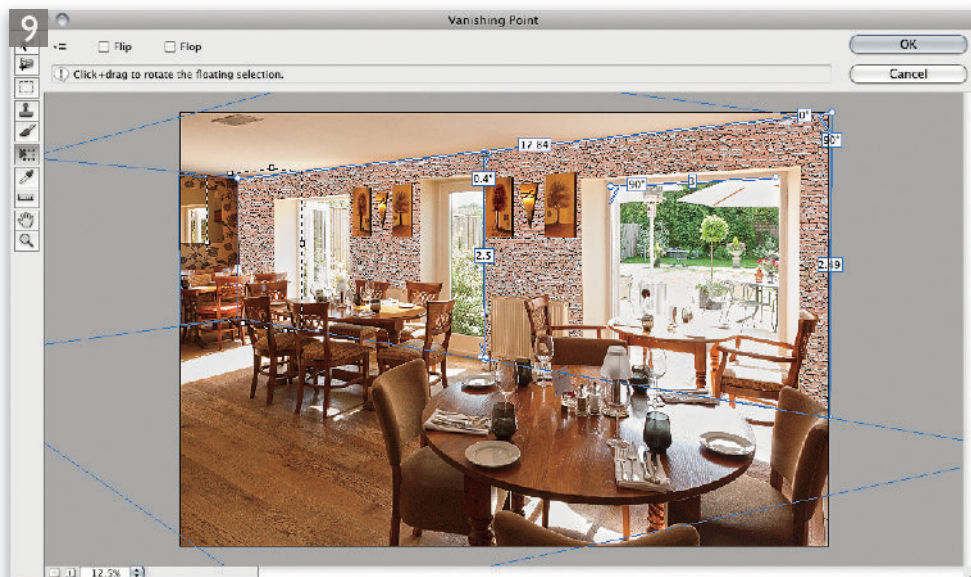
6 Working in Photoshop, I created a mask outline of the rear wall that excluded the wall lamps, picture frames and foreground elements. I then loaded this mask as a selection.



7 Meanwhile, I opened an image of a brick wall texture. I used **⌘ A** **ctrl A** to select all, followed by **⌘ C** **ctrl C** to copy the selected contents. I then closed this image and returned to the main interior image and added a new layer so that the following Vanishing Point editing work would be added to this layer.



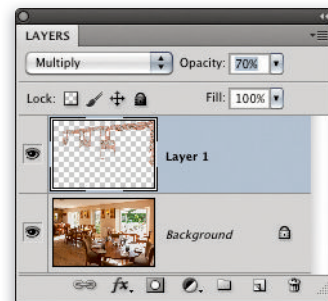
8 I opened Vanishing Point again and used **⌘ V** **ctrl V** to paste the copied brickwork image contents into the image. As I dragged the pasted selection, the contents aligned to the perspective planes defined in Vanishing Point. Here, I found it necessary to press **T** so that I could access the Vanishing Point transform tool and scale the pasted selection.



9 To extend the wall, I held down the **⌘ alt** key plus the **Shift** key and dragged the selection several times until the whole of the rear wall had been filled with the brick wall pattern.



10 To create the final version shown here, I set the layer blend mode to Multiply so that the brickwork layer blended more realistically with the shading on the wall, plus I also reduced the layer opacity to 70%.



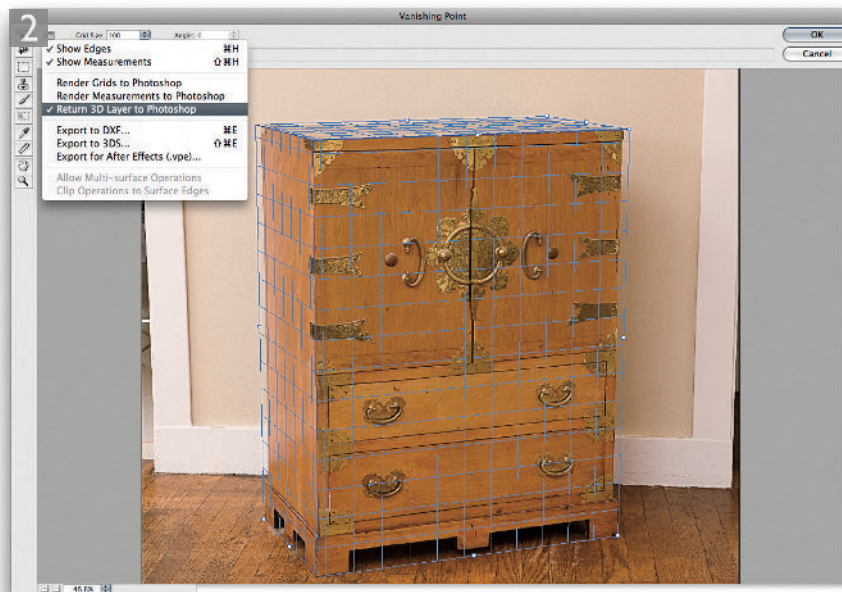
Editing objects in 3D

Those of you who have been using Photoshop for a long time may recall a Photoshop plug-in called the 3D Transform. It was introduced in Photoshop 5 and basically it allowed you to define objects (preferably cube-shaped objects) and transform them in three dimensions. It was a rather crude tool, but considered quite a progressive feature at the time. More recently it has been possible to edit photographs in perspective using Vanishing Point, but one of the little things that you may not have been aware of is the fact that you can export the planes that have been defined in Vanishing Point as 3D layers.

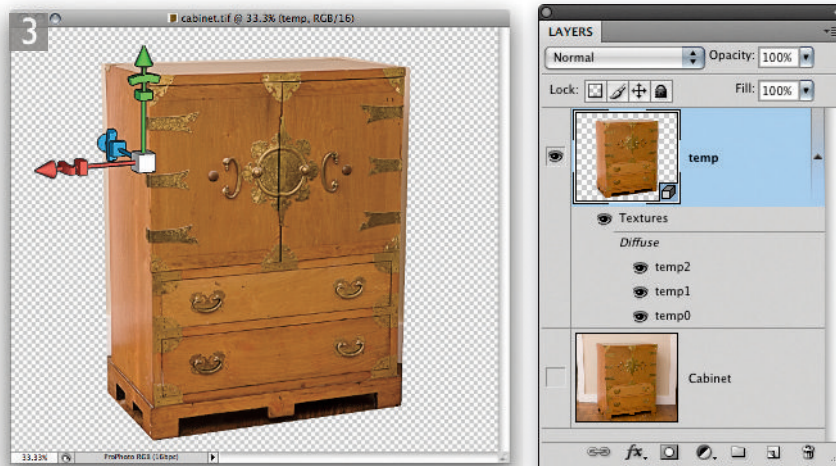
This tutorial shows how you can now use Vanishing Point to prepare an image as a 3D object before fine-tuning its position in another photograph. The perspective shift in this example is quite extreme yet, with some careful adjustment of the 3D controls and post-placement retouching, it is possible to achieve a fairly convincing finished result.



1 The object of the steps shown here was to take this scene of an empty room interior and add the cabinet image (shown on the left), which had been shot in a separate location, and overcome the problem of how to match the perspective of the cabinet with that of the room interior.

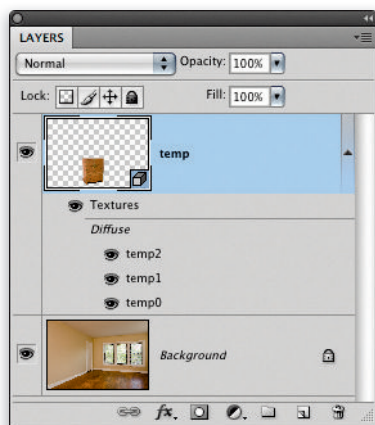


2 The first step was to select the photograph of the cabinet, go to Filter ⇒ Vanishing Point and define the planes of perspective. Once I had done this for the three planes, I went to the Vanishing Point options and checked 'Return 3D Layer to Photoshop'. I then clicked OK to process the selected planes as a 3D layer.

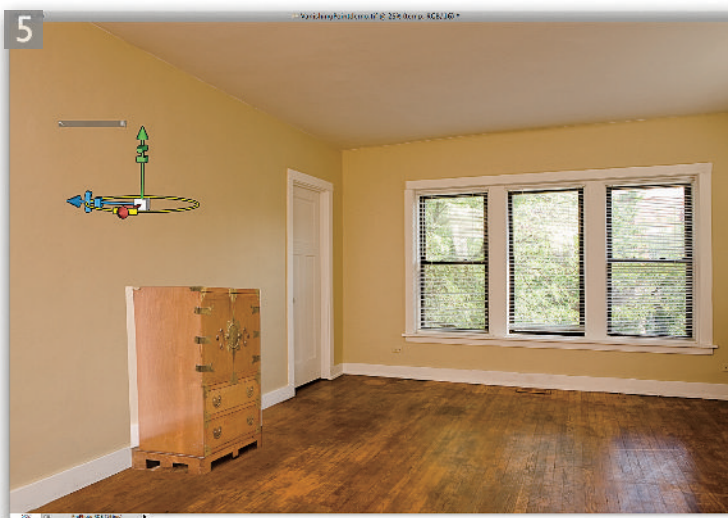
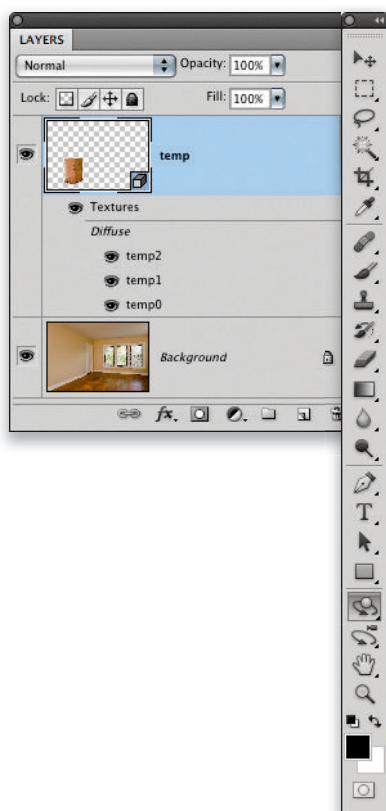


3 Here is the new 3D layer that has been added to the layer stack. The important thing to note here is that the planes defined in the previous step needed to be dragged far enough to include all of the cabinet. Also, when one of the 3D tools is selected in the tools panel, such as the 3D rotate tool, you'll see the 3D navigation widget shown here.





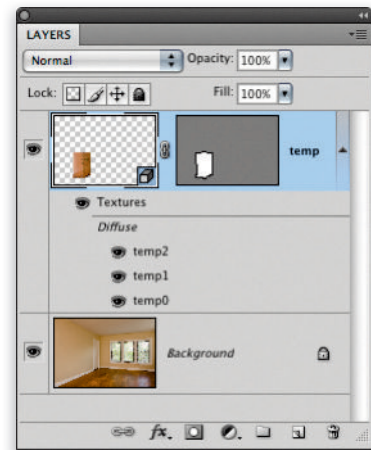
4 Next, I selected the move tool to drag and drop the 3D layer across to the photograph of the room interior.



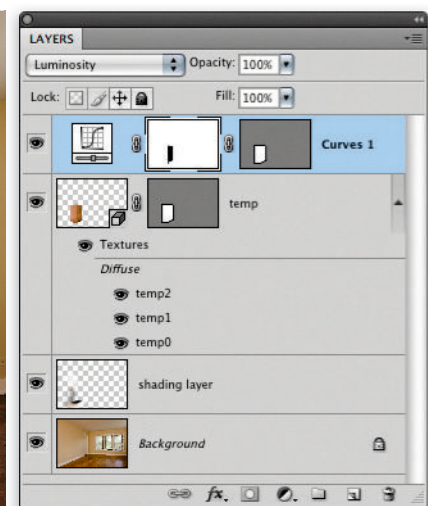
5 I was now able to maneuver the 3D layer of the cabinet into position. Initially, I used the move tool to roughly position the cabinet against the wall and then selected one of the 3D tools from the Tools panel so that this switched on the 3D navigation widget shown here. If you look closely you will see a small magnifier icon. You can drag on this to scale the navigator to make it bigger (as shown here in the screen shot). Now comes the tricky bit of aligning the perspective of the cabinet with the room interior scene. Here I could have used the various 3D tools to select a specific 3D plane to manipulate. The other option was to click on the 3D navigator widget control, which allowed me to manipulate the scale, rotation and panning in each of the three planes.



6 This shows the cabinet after I had fine-tuned the 3D controls to get it placed as accurately as possible against the wall. Once it was in place I used the pen tool to draw a vector path around the outline and then clicked on the Add vector mask button in the Masks panel to convert this to a mask.



7 In this final version I did a few extra things to make the new placement of the cabinet look more convincing. To start with, I added a new layer beneath the 3D cabinet layer, set the blend mode to Multiply and painted with dark sampled colors to add shadows below and behind the cabinet. I then added a darkening Curves adjustment layer above the 3D cabinet layer to darken the left side panel. I also used the vector mask created in Step 6 to clip the adjustment to the cabinet layer and painted on the pixel layer mask with black to prevent the Curves adjustment from affecting the front of the cabinet.





Photograph: Jeff Schewe.
Sinar 8 x 10 View Camera with Ektachrome ISO 100 film | 300 mm Fuji APO lens @ F45 | Balcar Studio Strobe | Epson V750 Scanner



Chapter 5

Now you see it, now you don't

Some easy ways to retouch your photographs

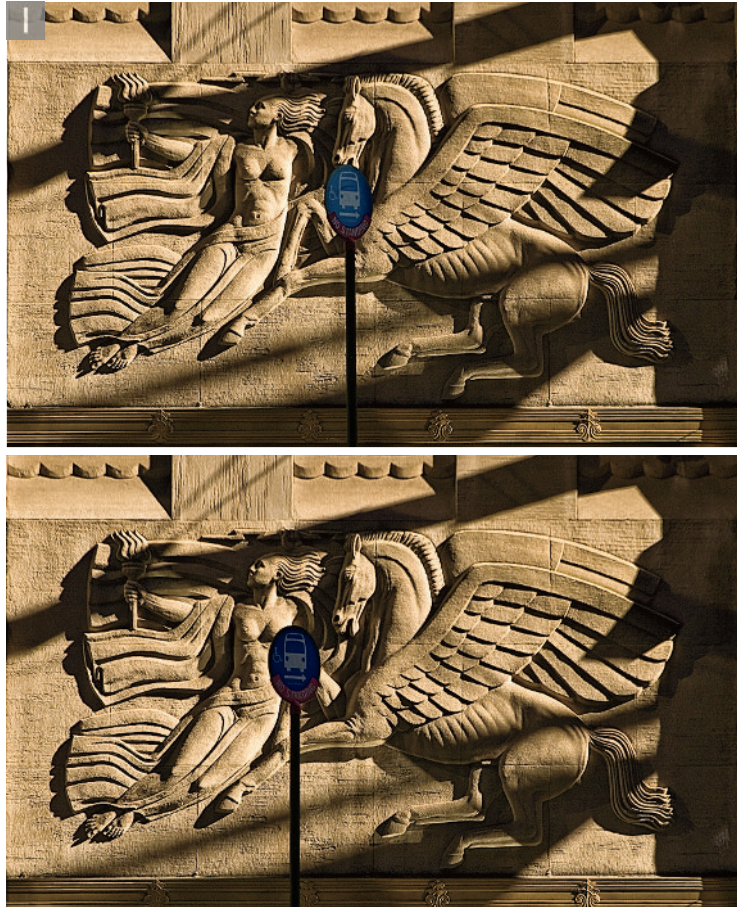
For as long as there has been the means to retouch photographs (with or without the use of a computer), photographers have been interested in finding ways to manipulate their photographs. While Photoshop is a very complex program, this chapter has been designed to show you a number of handy retouching tricks that don't require you to be an accomplished retouch artist. The tutorials contained in this chapter are all fairly easy to follow and show a number of ways you can remove objects from an image quickly and easily without needing to use standard retouching tools such as the clone stamp or healing brush.

Removing objects

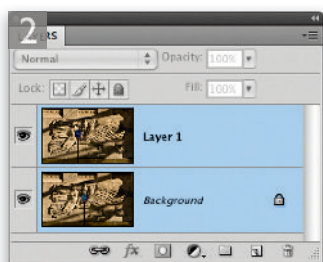
Removing foreground objects

Don't you hate it when street signs or overhead cables get in the way of a great view? Here is an easy way to get rid of offending foreground objects, although to use this technique you will need to shoot several frames of your subject and step slightly to the left or right between each exposure. You don't need to shoot using a tripod, just try to keep the background subject more or less in the same position in the frame. To process these photographs in Photoshop, all you have to do is choose the two best frames where there is enough displacement between the two shots to achieve a clear view of the main subject behind whatever objects are in front of it.

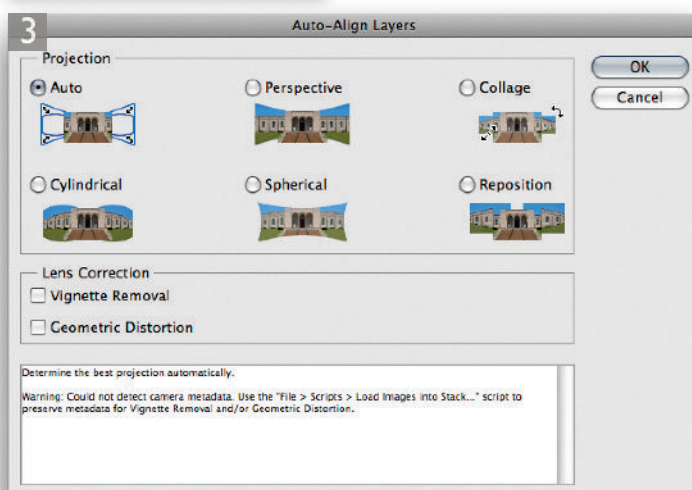
1 Here are two photographs shot of the same subject, but captured from two slightly different angles. In this example, I shot the frieze on this wall from across the street and sidestepped just a few feet to the right to capture the second exposure. The view of the frieze was more or less consistent, but this slight shift of camera perspective was enough to displace the street sign in both photographs.



Now you see it, now you don't



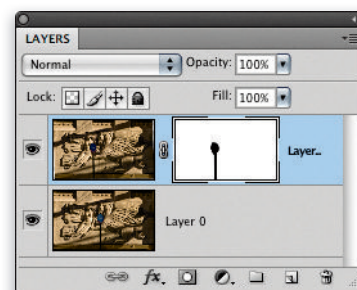
2 I opened the two photographs shown in Step 1 and used the move tool to drag one on top of the other as a new layer. I held down the **Shift** key as I did this so that the second image was placed above the other, keeping the frame positions in exact registration.



3 To align the picture content, I needed to hold down the **Shift** key to select both layers and choose **Edit > Auto-Align Layers...** This opened the dialog shown here, where I clicked on the **Auto** option to automatically align the two layers.



4 The retouching part was really simple. For this final step, I selected the uppermost layer and clicked on the **Add layer mask** button to add a new empty layer mask. I then selected the brush tool and used black as the foreground color to paint over the street sign. This technique worked well here because the auto-alignment in Photoshop had done a near perfect job of aligning the two layers.

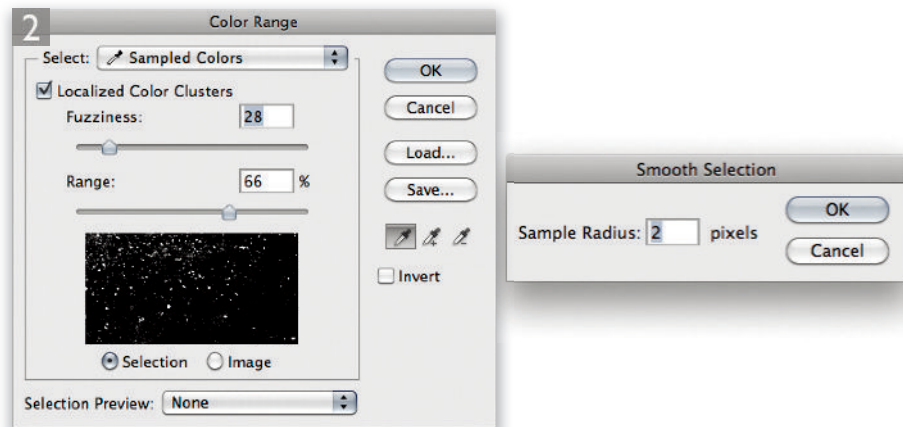


Leaf blower technique

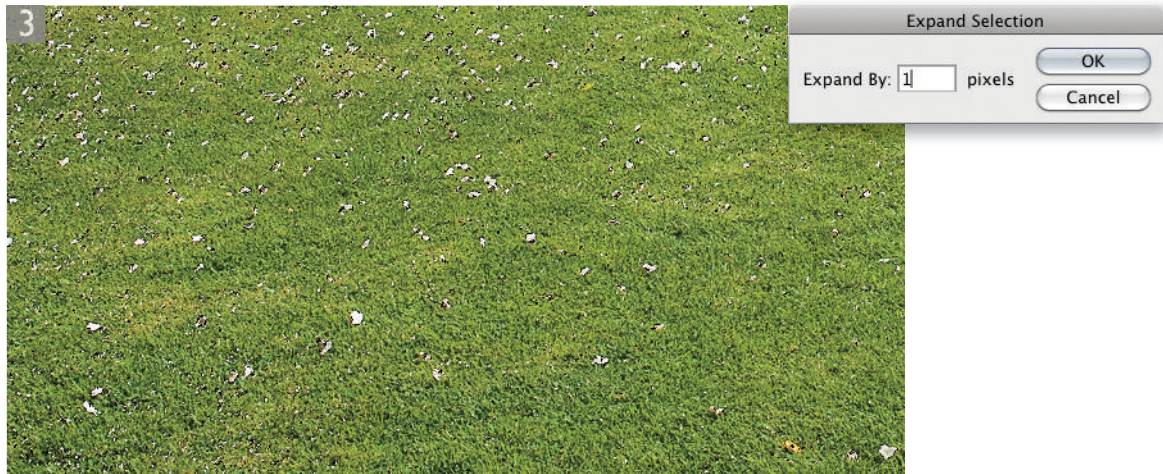
There are many ways that the new Content-Aware fill command can prove useful and here is one I have just discovered – it makes an excellent leaf blower. Real-life leaf blowers are a nuisance and, I gather, banned in certain parts of California, but the digital leaf blower offers a nice, eco-friendly alternative.



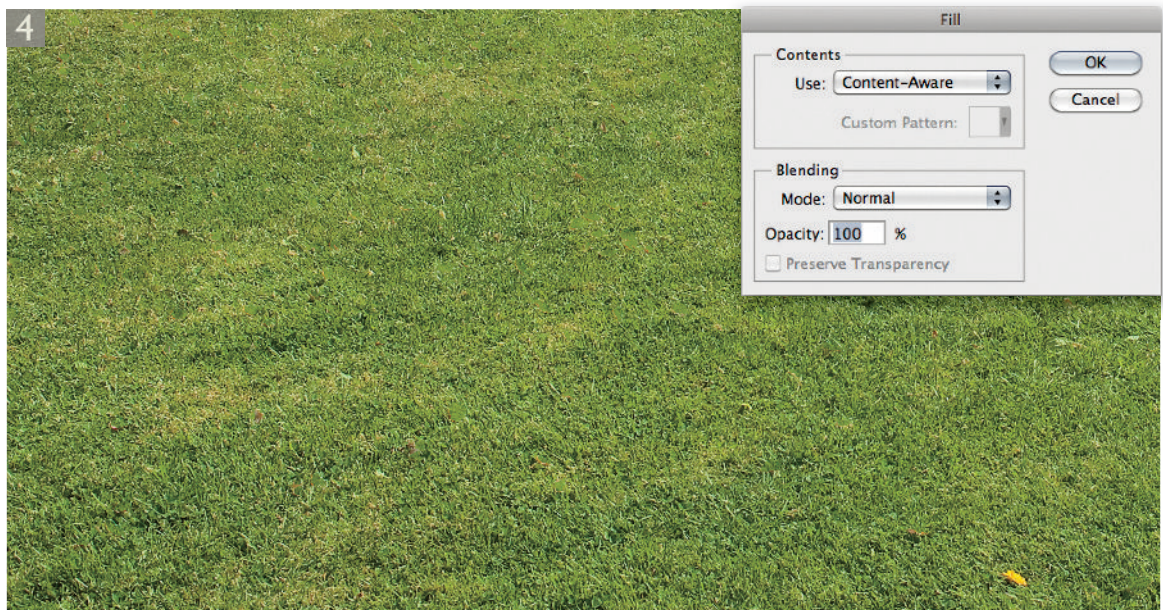
1 First of all we have here a photo taken of a lawn where we can see a lot of blossom petals have fallen on the grass. What I am going to do here is show how to remove these quickly from the picture, but without having to laboriously use the clone stamp tool or healing brush.



2 I went to the Select menu and chose Color Range... I used the eyedropper tool to select the petal leaf colors and also clicked on the 'add to selection' eyedropper tool to add more colors to the Color Range selection. I adjusted the Range and Tolerance sliders to perfect the initial selection and used Select ⇒ Modify ⇒ Smooth, entering the Sample Radius value shown here to smooth the selection.



3 I went to the Select menu again, chose Modify ⇒ Expand and entered a value of 1 pixel. More may be needed sometimes, but in this instance, 1 pixel seemed to work best.



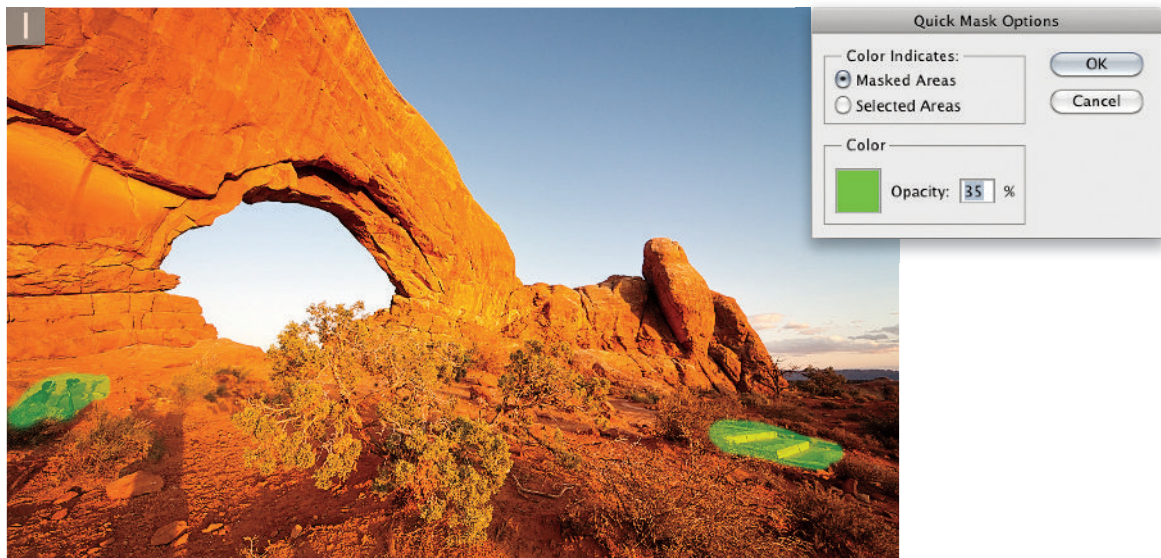
4 I then hid the selection and hit the **Delete** key. This popped the Fill dialog shown here, where I left the options to the default setting with Content-Aware selected. The end result was that the Content-Aware fill calculated how best to fill the selected area and produce the result shown here, where the petals have all magically vanished.

Content-Aware filling

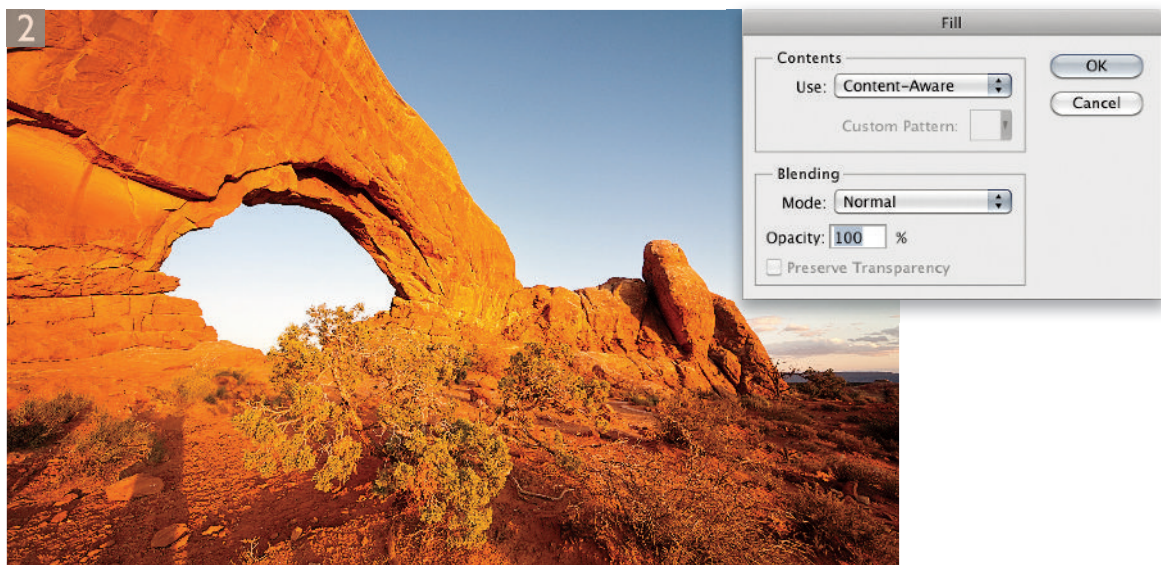
The Content-Aware fill is a major new tool in Photoshop CS5 and it has lots of different applications, a few of which are shown in this book. In the example shown opposite I switched to Quick Mask mode in Photoshop so that I could use the brush tool to simply paint over the areas I wished to remove, just as if I were marking up a proof image to indicate which bits needed altering. The difference here is that it is really easy to turn such brush strokes into a selection and from there invoke the Content-Aware fill command and automatically fill the selected areas. You'll notice in step 1 that I changed the quick mask overlay color from red to green. The reason I did this was in order to let the green overlay stand out more from the red rock in the photograph.

Multiple Content-Aware fills

The main thing to understand about Content-Aware filling is that it is a dumb process that mostly manages to do a pretty good job of knowing how to fill a selected area. It does this by sampling detail from outside the selection area and automatically works out how best to reconstruct the sampled data when reconstructing the area inside the selection. As automated processes go it's quite amazing the way it does this, but it's still a dumb process and you can't expect to see it work flawlessly every time you use it. I suppose part of the problem is that writers such as ourselves have carefully chosen just the right types of images to show the Content-Aware feature working at its best and this in turn may lead to false expectations. Our experience is that this is a tool you sometimes need to coax into producing the best results. One thing to watch out for is that you first make the most appropriate selection of the area you wish to fill. It is important here to make sure all the area you wish to remove is adequately selected and that the edge of the selected area doesn't intersect any detailed edges if possible. If the Content-Aware fill doesn't do a completely successful job the first time you fill a selected area (which is often the case), then you may find it helps to repeat applying the Content-Aware fill a second or even a third time. You see, each time you apply a Content-Aware fill you can often get better, smoother results. Another tip is to concentrate on just those areas where a Content-Aware fill hasn't done a perfect job, reselect these areas only and apply the Content-Aware fill again, but to the newly selected areas.



1 In this example I clicked **Q** to switch to quick mask mode using the Quick Mask Options settings shown here. I then selected the brush tool and simply painted over the areas I wished to apply the Content-Aware fill to.



2 I then clicked **Q** again to switch back to selection mode and chose **Select** ⇨ **Inverse** to invert the selection. I then chose **View** ⇨ **Hide Extras** to hide the marching ants and clicked the **Delete** key to open the Fill dialog shown here with the Content-Aware fill option automatically selected. As you can see, the areas I had painted over in step 1 were now successfully filled using the surrounding image area detail.

Specialist applications

There are various types of specialist users who will find the Stacks rendering feature useful. Scientists can use this as a tool for detecting small differences between images. Forensics users can use certain types of Stacks renderings to amplify minute changes in a series of images, while astronomers can use the Mean rendering to remove extraneous noise when combining a series of astronomy photographs. Some of us have argued that the Median rendering method should be made accessible in the standard version of Photoshop as well but, for now at least, this technique is only going to be available to those Photoshop users who have the extended version of Photoshop CS3 or later.

Layer blending to remove tourists

The Stacks feature lets you use special formulae to determine how layered images are blended together. To summarize how this works, you can take a multi-layered image, select two or more layers, convert these to a Smart Object and apply a Stacks rendering. This feature was really designed as a tool for analytical work in areas such as forensics, medical imaging and astronomy photography (see sidebar). It is because of these rather specialist applications that the Stacks feature has so far been limited to the Extended version only of Photoshop, which is a shame really because the Median Stacks rendering mode can also be applied to creative tasks such as removing tourists from a busy location scene (or can be an effective way to reduce noise from a series of hand-held shots, as shown in Chapter 8).

Median rendering

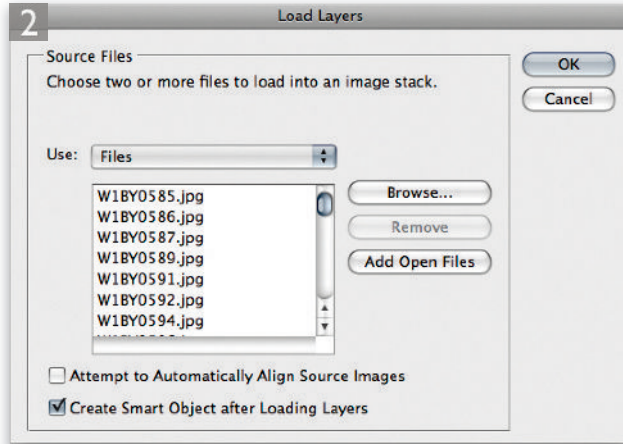
Of all the different rendering methods you can apply to a series of layers in a Smart Object, the Median rendering is probably the most interesting. This is because it works by analyzing each and every pixel location in a stack of images and selects whatever is the most common pixel value to all the layers at a given point. A Median rendering can therefore be used to smooth out the differences found between individual exposures in a stack and is most useful for processing a sequence of photographs that have been shot from the same angle. This technique will allow you, as shown here, to remove people who have been captured moving through the scene in front of the camera. The following technique will therefore work best for photographs that have been taken using a tripod. Having said that, on the day we shot this a young photographer approached us; we got chatting and explained the technique. Later on that day he emailed us with the result he had got from hand-holding the camera using just half a dozen frames that had been shot over a much shorter period of time. The picture he created was actually pretty good for what was a quick, first experiment using this technique. Basically, you can make this work hand-holding the camera, but for best results we suggest you use a tripod.



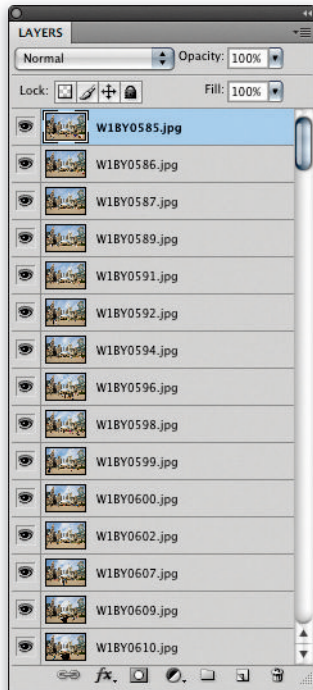
1 This shows just a few of the photographs that we shot of a sculpture in Chicago that is popularly known as the Bean. We took these pictures early afternoon over a period of an hour, at a time when a large number of people were visiting. The most crowded area was right underneath the Bean itself, which was why Jeff and I took it in turns to capture well over a hundred frames. This ensured that we had enough pictures so that a Median Stacks rendering would allow us to remove all of the people from this scene.



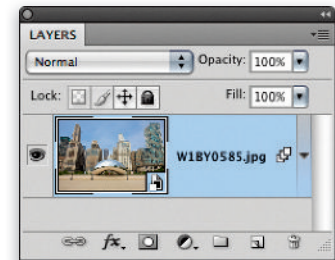
Figure 5.1 The Median Stacks rendering technique works best if you do what we did here and shoot the pictures using a tripod with a cable release.



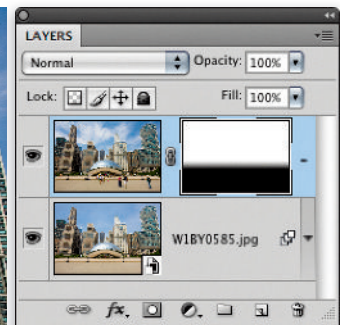
2 The first step was to go to the File ⇒ Scripts menu and choose Load Files into Stack. This opened the dialog shown here, where we clicked on the Browse... button to locate the folder containing all the images that had been shot that afternoon. We also checked the Create Smart Object after Loading Layers option (although you could do this separately in Photoshop afterwards). If these shots had been taken hand-held, we would also have checked the Attempt to Automatically Align Source Images option, but since these had all been shot using a tripod (see Figure 5.1) there was no need to do so. We clicked OK to start loading the layers.



3 It may take a while for Photoshop to open all the images, add them as layers and create a Smart Object. 128 images were added here and, as you might expect, the time this takes will all depend on the size of the individual images and how many there are. What we ended up with was a new document with a Smart Object layer that contained all the selected image documents grouped as layers within a Smart Object. When we double-clicked the Smart Object layer we were able to see the full expanded list of layers contained in the Smart Object.



4 Now for the clever part. First we needed to make sure that the Smart Object (that we showed open in Step 3) was closed, so that the Layers panel looked like the example shown here, showing a single Smart Object layer. We went to the Layer menu and choose Smart Objects ⇒ Stack Mode ⇒ Median. Again, the Stacks rendering took a little while to complete, but once it was finished the Median rendering managed to blend the layers such that nearly all of the people in the merged picture had disappeared completely.



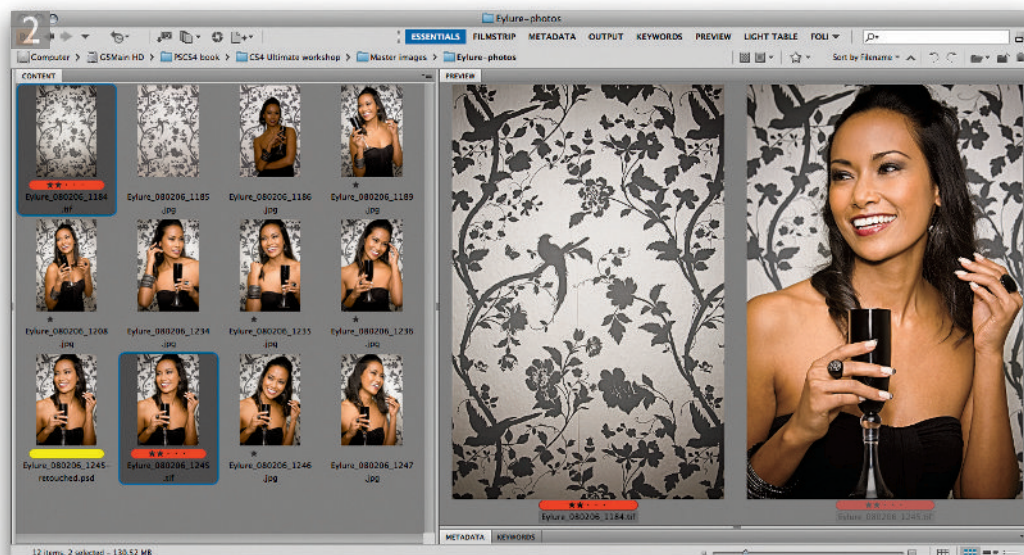
5 Although the Image Stack Median rendering did a pretty good job of removing the people from the scene, it ended up smoothing out the sky to the point where we lost any cloud detail. We selected one of the original images where there were some interesting clouds, added this as a new layer and applied a linear gradient to the layer mask to replace the top half of the photograph.

Tidying hair against a busy backdrop

Here is an interesting challenge that I was presented with recently. I shot the model shown on these pages for an advertising job and was asked by the client to make sure that the skin tone and nails looked flawless. After they had seen the initial retouch work they also asked if I could clean up the hair outline. At first it looked like this would be impossible to achieve. After all, how on earth can one use the clone stamp or healing brush to tidy up the fine hair strands against a background which consisted of a busy wallpaper pattern? As it turned out, the solution to this problem was staring me in the face!



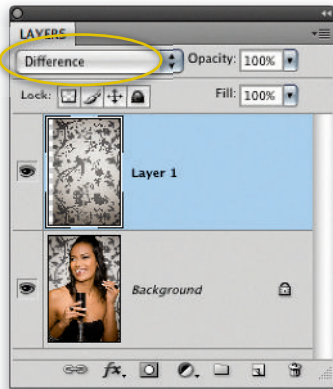
1 Here is a beauty photograph where I had retouched for the skin, eyes and nails, but the client requested that I tidy the hair outline more. As you can see, there were a lot of loose stray hairs that overlapped the wallpaper backdrop.



2 In search of an answer, I went to Bridge and checked out some of the other shots that I had taken during the shoot. Fortunately, I had not discarded the original test shots that were taken at the beginning of the shoot and found a photograph of the wallpaper without the model in front of it. The moral here is that you never know when a shot may prove useful, which is why we recommend you never delete anything.

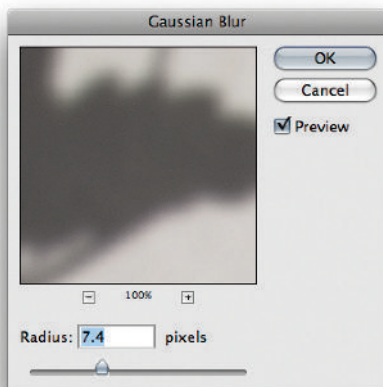


3 I opened the two images that I had selected in Bridge and dragged the wallpaper image across to the main model photograph image to add this as a new layer.



Difference blend mode registration

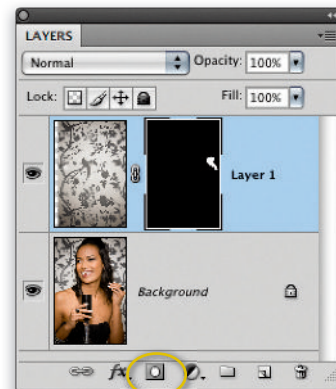
As you can see here, the Difference blend mode is invaluable when it comes to positioning layers in register with each other. You can also use the Difference blend mode to carry out analysis work, such as when you wish to highlight minute differences between the way an image has been processed. For example, you can use this technique to compare the results from using JPEG compression settings.




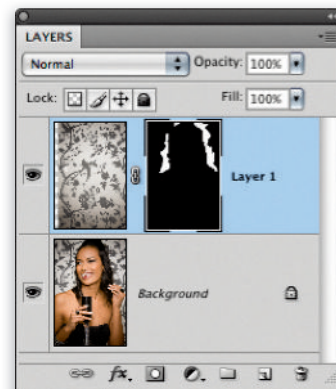
4 The next thing was to align the backdrop layer with the main image below. I set the wallpaper layer blend mode to Difference, which made it easier to see when the wallpaper layer was in pin register (see sidebar) as I used the move tool.



5 As you can see in Step 4, I was first able to roughly align the two layers. The problem here though was that the wallpaper in the model image was blurred and the wallpaper in Layer 1 was sharp. In order to get the two layers to match, I kept the Layer 1 wallpaper layer in Difference mode and applied a Gaussian Blur filter until the Difference blend mode showed that the two layers matched more closely.




6 I returned the wallpaper layer blend mode to Normal again and -clicked the Add new layer mask button in the Layers panel (circled) to add a layer mask to the layer, filled with black. I then used a hard-edged paint brush to paint with white on the layer mask. This allowed me to paint on the photograph from the wallpaper layer and clean up some of the stray hairs.



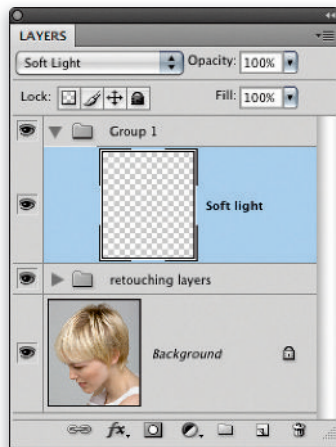
7 Here is the finished version where you can see a close-up view of the hair outline. If I hadn't taken a picture of the backdrop on its own, I could always have sampled bits of backdrop detail in other shots from the same sequence, but in this instance having access to the out-take backdrop image made my life a lot easier.

Coloring hair roots

As a beauty photographer who specializes in hair work, I often get asked to lighten the hair roots so that the hair looks like it has a more even color. Here is a fairly simple two-step process that can be used to help lighten the dark roots.

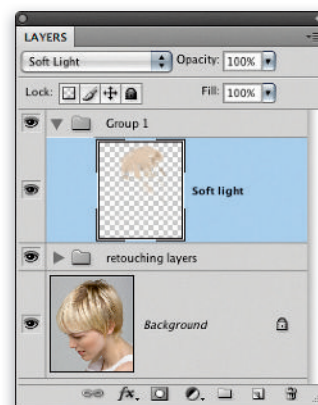
With this technique I basically add two empty layers and set one to Soft Light blend mode and the other to Color. Painting on the Soft Light layer then allows me to selectively add a fill light to the dark areas of the hair, while painting on the Color layer allows me to colorize the hair to make the hair color look more even. When I paint with the brush tool, I use the  **alt** key to switch to eyedropper mode and sample a new lighter hair color from the image and use this as the foreground color to paint with. The trick here is to use a low-opacity, soft-edged brush and to keep resampling new colors as you paint. The Soft Light mode worked well here at lightening the hair, but you may want to use the Overlay blend mode instead when retouching some hair shots.

1 To disguise the hair roots that were showing in this photograph I added a new empty layer, set this to the Soft Light blend mode and placed this layer inside a layer group.

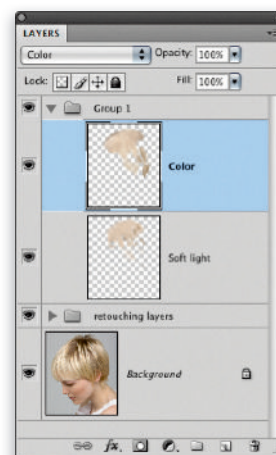




2 I selected the brush tool and held down the **alt** key to sample a color from the lighter hair color area and gently painted over the dark hair areas where the roots were showing most. This step colorized the hair yet also lightened the darker areas, but without destroying the detail in the shadows. This was kind of like a 'filling in the shadow areas' step.



3 I added a new layer within the layer group and set the blending mode to Color. I then used the brush tool to sample more colors (holding down the **alt** key) to paint on the Color layer. I found when editing both this and the Soft light layer that it helped to use the eraser tool (rather than add a layer mask) to remove paint from these two layers. I was therefore able to work quite quickly by toggling between the brush tool and the eraser.



The History of History

The History feature was added to Photoshop 5 by Mark Hamburg, who had been tasked to add multiple undo. Mark had been influenced by seeing a demo I had done of Globe Hands and used it as inspiration for the History feature. Mark got a patent in his name and was named Silicon Valley Software Inventor of the Year (in 1999). I got a Photoshop feature designed just for him. A fair trade, in my opinion.

Snapshot painting

A different way of compositing

It's often said that those who forget history are doomed to repeat it. I'll alter that a bit and say that those who forget History are doomed to use layers. The History feature of Photoshop is a powerful and severely under-utilized tool and can radically alter the way digital imaging is done.

The proof that using History can be radical is the fact that the Globe Hands image was done in 1994 using Photoshop version 2.5 – well before Photoshop even had layers. The way of working is very different but the results cannot be duplicated using layers. To understand how to use History requires a bit of learning and practice, but once learned, it can be deployed for a range of imaging needs – as long as you don't forget History is there.

The Globe Hands image (Figure 5.3) is a composite of two original scans from 4 x 5 film (Figure 5.2) as well as substantial retouching for the globe and image warping for the hands. But before I get too far into the technique, I'll need to point out that this image was done back when computers could only hold megabytes of RAM, not gigs. As a result of the early computer limitations, I used a process where I selected a smaller portion of the image and sliced it out to do the heavy work, and only replaced the subsection after the imaging was completed.

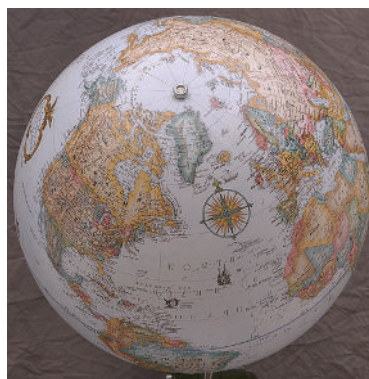


Figure 5.2 The original hand scan, the original globe scan and the retouched globe layer.



Figure 5.3 The final image after compositing, retouching, final tone and color adjustments and the addition of a rough-edged frame.

Remembering the old times

In the past, Photoshop's primary limiting speed factor has been RAM access. Photoshop CS5 when run as a 64-bit application can access whatever the motherboard can address. But when I first started using Photoshop, it was a struggle to use a paltry 64 megabytes of RAM. Hence the use of techniques to minimize the size of the images being loaded into Photoshop.

Slicing an image

Photoshop used to have a plug-in called Quick Edit that would allow you to specify a subsection of an image to open and then save the manipulated subimage back into the full image file. What follows is the manual way of carrying out that same type of function, but with some added benefits. Note that this does take practice and attention to detail so that you can put things back together correctly in the end. But the technique still offers benefits.

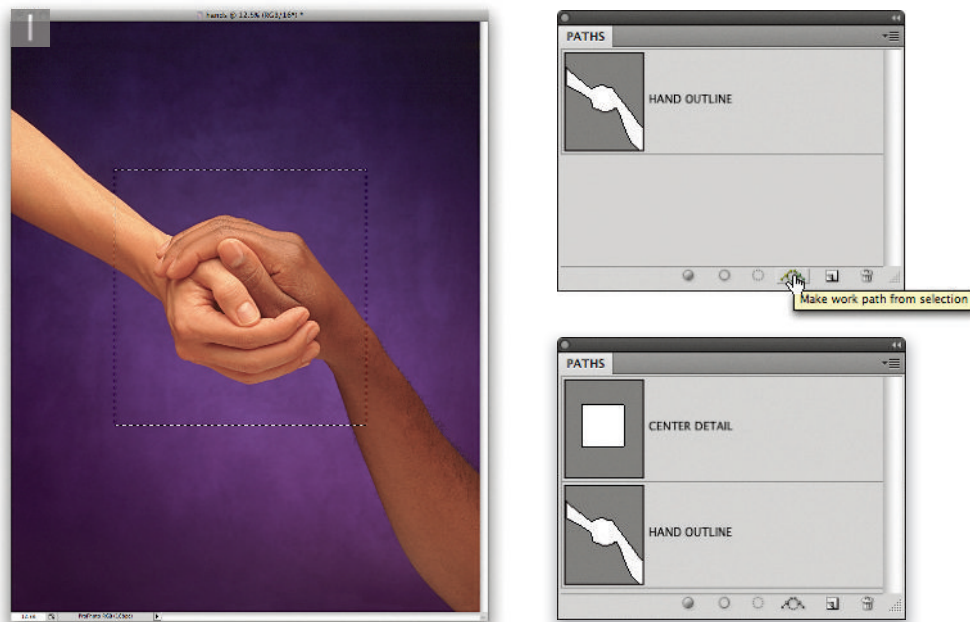
The first step is to decide what section of an image you wish to use as the subsection image. Create a marquee selection (Step 1) and then convert that into a path. Be sure to save the path in the full image before proceeding. For the Globe Hands image, the CENTER-DETAIL path would be turned back into a selection before cropping to the selection and then saving the cropped file as CENTER-DETAIL (Step 2). This new file would then be used for all the warping and snapshot painting.

Image warping

Prior to beginning the snapshot painting, I altered the shape of the two hands (see Steps 3 and 4). Even though I had the fellows wrap their hands around a cue ball that was mounted on a long rod running through the background, their hand shapes weren't round enough. To round out the hands I used Liquify.

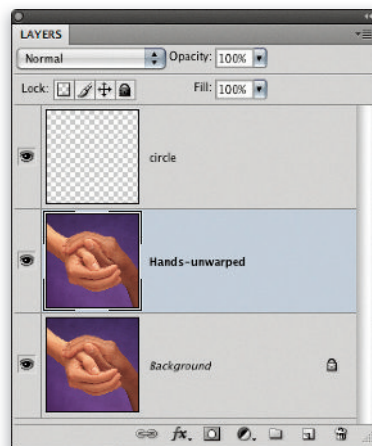
After duplicating the background to a new layer and renaming it, I added a new layer named 'circle' that was the size and shape I wished to warp the hand to match (Step 2). I warped the hands using Liquify and allowed the circle layer to show as a guide, which is shown in Step 3 on the following page. I used the Show Backdrop option set to show the Circle layer.

Using the forward warp tool shown in Step 4, I gently pushed sections in or out to get a more rounded shape. I lowered the Brush Pressure to 24 and set the Brush Density to 100. I needed to do the work of warping them carefully. The hands didn't need to be perfectly round – that would have actually looked odd. The aim was to make them rounder without making it look like I had done anything to them. That's one of the keys to image manipulation – doing something so that the end results don't look like you did anything!

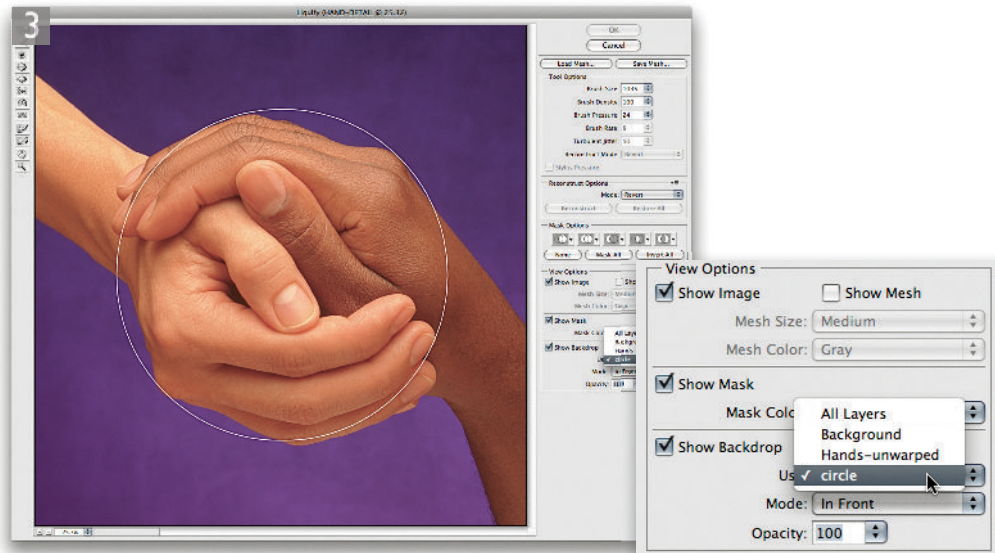


1 The image on the left had a marquee selection drawn in the center of the image that defined the area to be used for the main image manipulation. In the Paths panel I clicked on the Make work path from selection button. I suggest naming paths with a consistent and descriptive name so you'll remember what the path is intended to do.

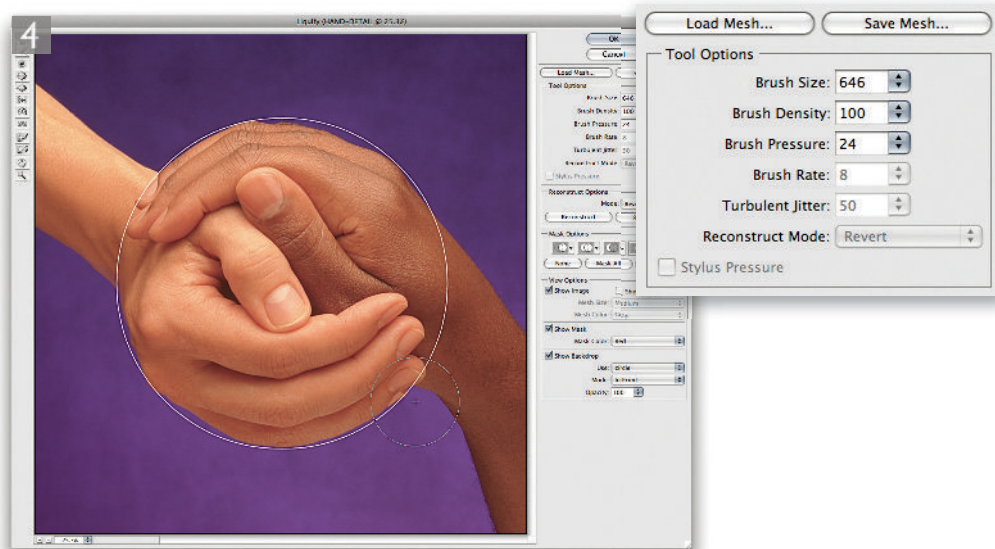
2



2 After I had saved the cropped image, I named it HAND-DETAIL and duplicated the Background layer and renamed it Hands-unwarped. It didn't really matter what the name was, I was going to rename it anyway, but it was important to have a descriptive name so in drop-down menus (such as in Liquify) I could be assured of knowing what layer was doing what.



3 The first step was to go to the Filter menu and choose Liquify and activate the circle layer so it showed as a visible guide for where the hands needed warping.



4 The rest of the warping was done using various sized brushes to gently push and prod the shape of the hands into a more rounded shape. One of the keys to successfully warping images in Liquify is to first have a high enough resolution image to work with and secondly not to try to do too much. In this case, the amount of warp was sufficient to round out the hands to receive the globe image.

History basics

Before you can really make full use of History as a creative tool, you need to understand some of the fundamentals and how the different options work. In this particular example, I also had to do some preparatory work prior to actually doing the snapshot painting. I suppose the first thing to realize is that there is a relationship between layers and how those layers are used when creating snapshots. For the Globe Hands image, I prepped the HAND-DETAIL image so as to have the proper layers in place before making snapshots (see Figure 5.4).

First though is an explanation of the different options found in the History Options – they have an important role in using History successfully. To access the History Options, select the menu item from the fly-out menu.

Allow Non-Linear History allows you to go back in time, to use a History event without wiping out things you've already done (see Figure 5.6). If you are a sci-fi fan and understand the 'grandfather paradox' this means you can go back in time, kill your grandfather and you won't cease to exist. If you don't understand this, you can leave this unchecked (but I like to use it and so should you). The next check box makes sure that when you click on the Create new snapshot button, you'll get the full New Snapshot dialog (which is really important).

You can choose to have a new snapshot created when saving (I consider this marginal in usefulness). This option will do a full document snapshot when you save. The last option, Make Layer Visibility Changes Undoable, I actually find confusing so I don't use it.

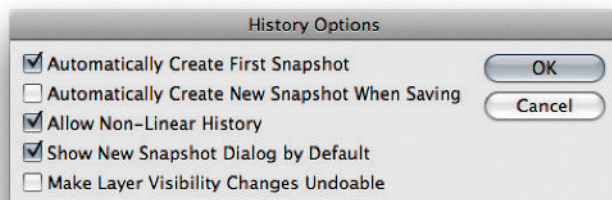


Figure 5.6 By default, the check box for automatically creating the first snapshot is checked. I suggest checking the additional check boxes shown above. I don't bother with creating a snapshot when saving – I save a lot so it would clutter the History panel. I also don't bother checking the layer visibility as part of the changes. That complicates the History steps and makes toggling a layer to see before and after part of the History.

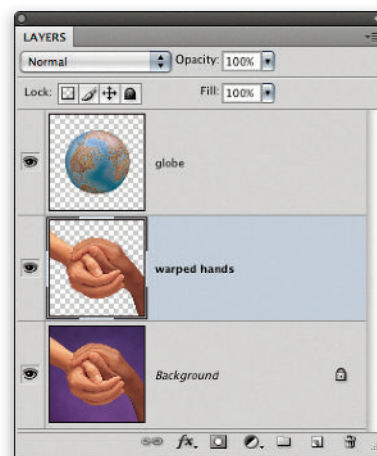


Figure 5.4 The HANDS-DETAIL image (a subsection of the main image) had three layers: the Background image of the warped hands, the warped hands outlined as a separate layer and the globe layer sized and positioned for placement.

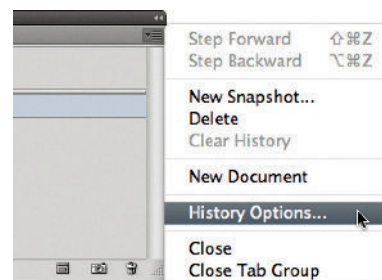


Figure 5.5 In the History panel, I selected the fly-out menu for the History Options which brought up a dialog box allowing the selection of various options.



Figure 5.7 Unless you check the Show New Snapshot Dialog by Default option, clicking this button simply makes a new snapshot of the Full Document, which is not useful for our purposes.

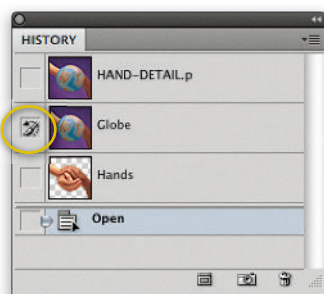


Figure 5.8 When properly prepared, there would be a snapshot named Globe that had all layers merged into one and a separate snapshot named Hands which was a snapshot of only the hands floating on their own layer. The snapshot that will be used for any History function is selected by clicking in the active snapshot column. In this figure, the Globe snapshot was set as the History source (inside the circle) and would be used for filling and painting from History.

Making snapshots

In order to use snapshots, you first must make them and be sure of what is contained in the snapshot. Not all snapshots are created equal (nor are they all useful for snapshot painting). There are three flavors of snapshot: Full Document, Merged Layers and Current Layer. Of these, I'll only use the Merged Layers and Current Layer flavors. They do substantially different things and offer very different results. The Current Layer option (Figure 5.9) only stores the currently targeted Photoshop layer. This is useful when you want to be able to fill or paint using History to return to the state of that layer when you made the snapshot.

However, for creative purposes, the Merged Layers flavor (Figure 5.10) is far more useful – this is the only version that allows you to paint or fill from different layers. You'll note that on the preceding page, all three layers were currently visible (Figure 5.4). So, when I did a Merged Layers snapshot, I was able to take the image data from the Globe layer and blend it into the warped Hands layer. If you've never used this snapshot option, you may have never discovered this important feature – blending the results of multiple merged layers into the targeted layer using History.

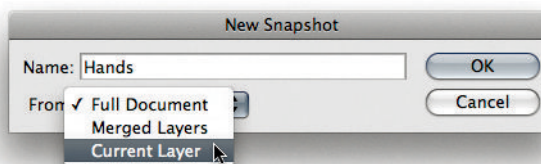


Figure 5.9 For the Hands snapshot, I needed to make sure the warped hands layer was the current target. This snapshot would be of the hands before I did any blending.

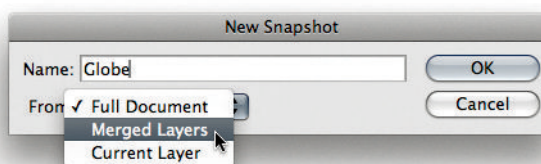


Figure 5.10 For the Globe snapshot, I needed to create the snapshot using the Merged Layers option. It didn't matter what layer was the current target, all visible layers would be included in this snapshot.

The channels

I won't dwell on how I made the actual selections and turned them into channels to be used later. Figure 5.11 shows the Channels panel and the variety of channels created prior to starting the snapshot painting. Obviously, I needed an area to fill into, and that's what the Globe paste channel provided. I also would need to treat the highlights and the shadows of the hands image differently.

The Globe paste channel was made by combining the Hands Outline channel with a circular marquee selection. The Hands Highlights and Hands Shadows were made using Color Range selections on the hands layer. The Finger Details selection was made using the pen tool and drawing around the fingers and then inverting the resulting channel after turning the path into a selection.

Snapshot painting is fundamentally different from layers in that you don't use a layer mask, you use a selection to constrain where the snapshot painting is blended. So preparing the selections accurately before you start the blending is critical. On the other hand, you do have infinite flexibility when snapshot painting in that you can always return to where you started by simply using the prepared snapshots. But clearly defining where the fill or painting occurs is the job of really good masks.



Figure 5.11 The above channels were created using a variety of techniques. The Globe paste and Hands Outline channels were made with paths. The Hands Highlights and Hands Shadows were made using Color Range. The Finger Details were also made with paths and then inverted.

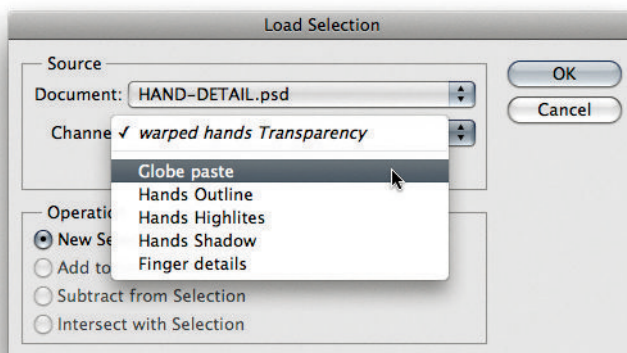

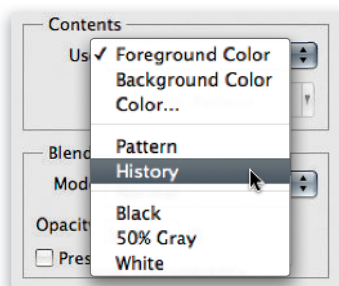
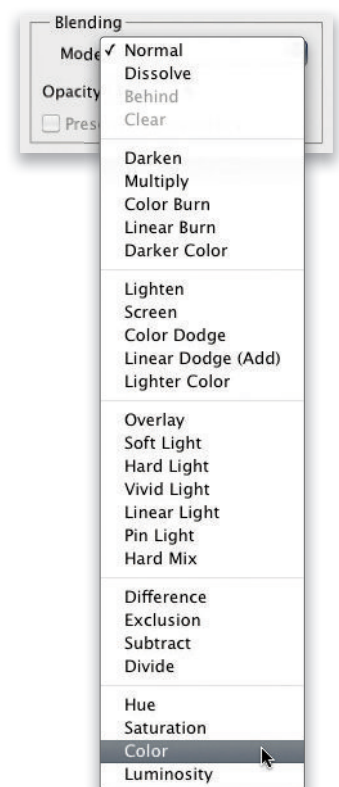


Figure 5.12 For this example, I used the Load Selection dialog box. I usually just  **ctrl**-click directly on the channel icon to load the selection. In this figure, I loaded the main channel (the Globe paste channel) as a selection. This was the active selection for the first few snapshot painting steps.



Contents Use: drop-down menu



Blending Mode: drop-down menu

Figure 5.13 The Fill commands will be set to use History as the content and a variety of blending modes will be used.

The blending

If you've never tried this process before, it can seem rather intimidating and complicated. But take heart, it's really not that hard once you grasp the functions of the snapshots and how to use History. It's important to remember that if you've properly created your snapshots of Merged and Current layers, you can interactively blend back and forth to achieve the results you wish. So, it's not like you'll really ruin anything if you make a mistake because you can always start afresh by using the correct History snapshot to get back.

To start the process, the targeted layer is the warped hands layer and the globe layer is no longer visible. It really has served its purpose once the Merged Layers snapshot has been created but it's still useful to keep in the event you need to remake a snapshot. The first steps will use the Fill command found under the Edit menu, although you can also use the keyboard command of **Shift Delete** to directly access the Fill command. Only after the fill series of adjustments is done will we start using the History brush to paint with.

The crucial setting in the Fill command is to make sure that the Contents drop-down menu is set to use History as shown in Figure 5.13. All of the blending will be done using the History option in the Fill dialog or using the history brush when doing actual brush-based painting.

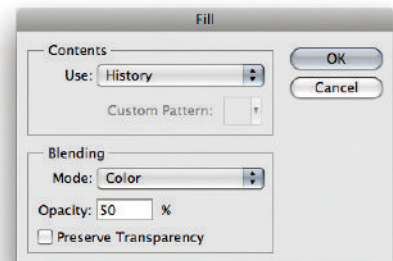
The other thing to keep in mind is that there will be a variety of blending modes (shown in Figure 5.13) used while working towards the final look. The primary modes are Color, Multiply, Screen, Overlay and Luminosity. When needing to return to a previous state, the Normal mode is used. Creatively, the Multiply, Screen and the combo Overlay are used the most. Multiply blend adds to the existing image data by darkening based on the fill content. Screen lightens the image by the fill content. Overlay is a procedural blend hybrid of both in that it lightens the fill content above level 127 and darkens below level 127. So, it lightens the lights and darkens the darks.

You'll also note that the opacities are almost always on the low side, with nothing ever done at 100% opacity. Subtlety is important in the blending. I prefer to build up gradually to create the effect I'm looking for rather than going over the top and having to try to get back.

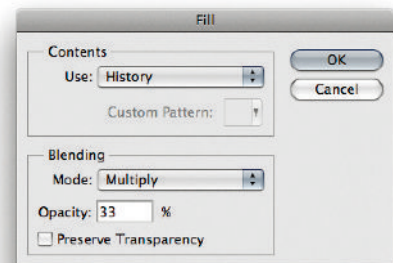
Now you see it, now you don't



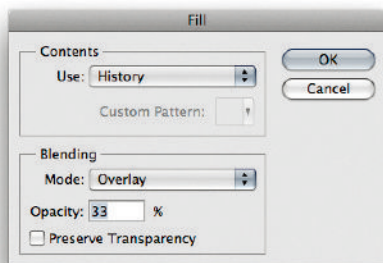
1 With the selection active, I used the Fill command and filled using a Color blend mode. Here I chose a 50% Opacity.



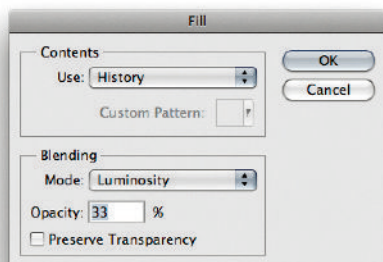
2 This shows the image after applying the Color blend fill. Next, I used Multiply with a 33% Opacity. The numbers for opacity are not an exact science. Much of the blending is based on a feeling (which takes time to develop). Remember you have multiple undo (the whole reason for the History feature) and you can always reblend from the other snapshot.



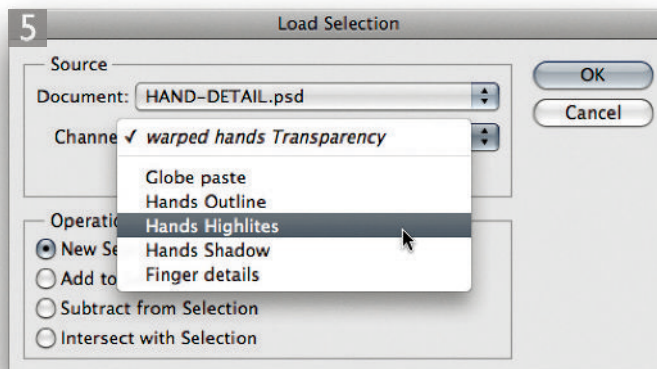
3 By using the Multiply mode, the whole Globe paste area had grown darker (which was to be expected). To bring back lightness, I used the Overlay blend mode, which screens above level 127 and multiplies below level 127. This lightened the lights and darkened the darks.



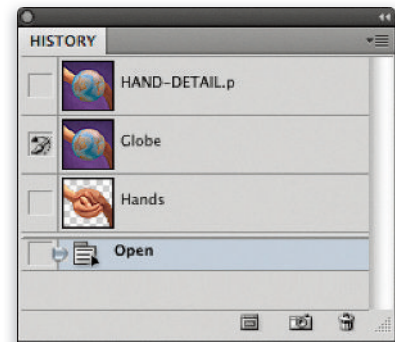
4 At this stage, the color and texture were growing towards the effect I wanted, but the luminosity had continued to get darker. To regain the original luminosity, I changed the History source to be the Hands snapshot and filled at 33% Opacity with Luminosity.



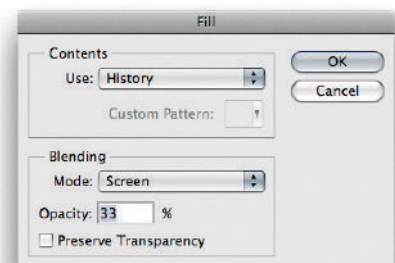
Now you see it, now you don't



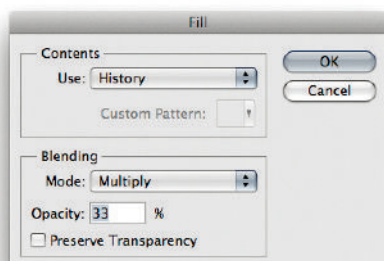
5 After filling in from the Hands snapshot, the History source was changed back to the Globe snapshot after loading the Hands Highlites channel as a selection.



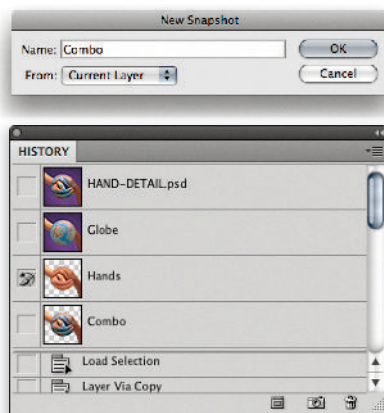
6 After loading the Hands Highlites selection, I filled from the Globe snapshot using Screen (to lighten) again with a 33% Opacity.



7 Here, the Hands Shadow selection had been loaded and the blending mode had been changed to Multiply to darken the shadow area by filling in from the Globe snapshot.

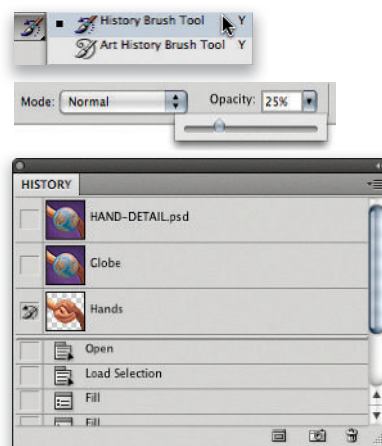


8 The overall look was starting to get finalized, but there was an area on both wrists that required special attention. Prior to working on these areas, it was useful to grab the state of the image blend as it existed at this moment. So, it was time to take another snapshot of the Current Layer which would add a fourth snapshot in the History panel. This snapshot was used to reblend the current state in the event that the next step removed too much detail.

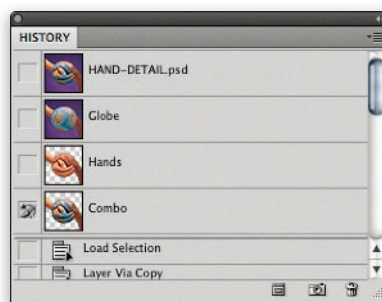




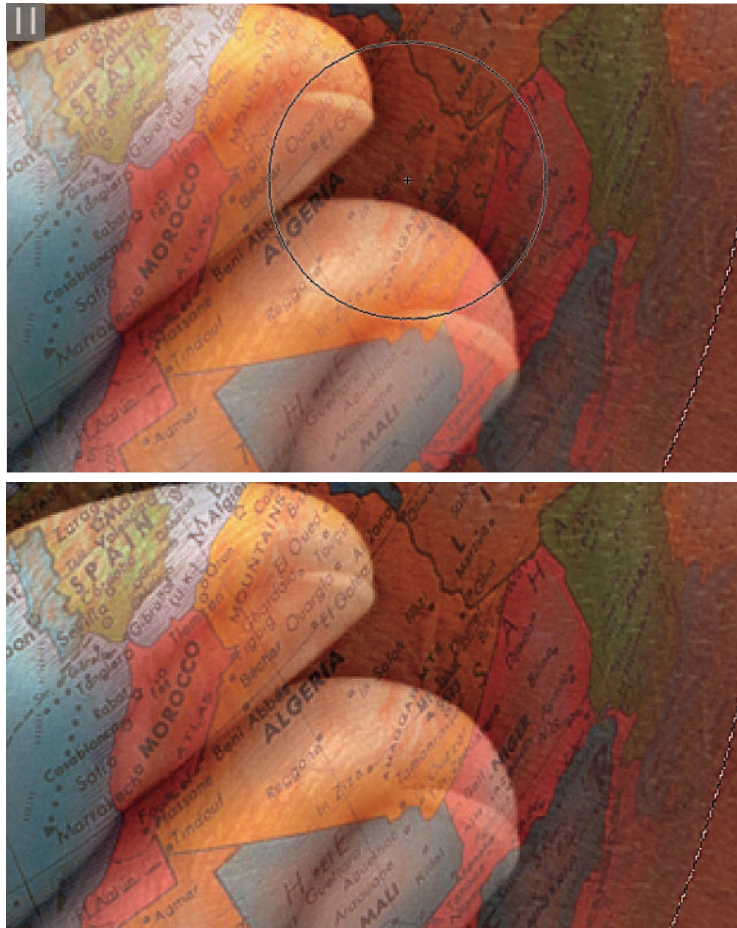
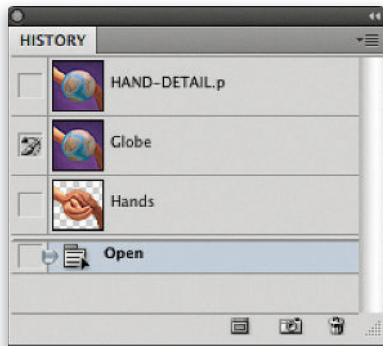
9 The time had come to do some brush work. The Finger Detail selection had been loaded and the history brush tool selected using a Normal blend and 25% Opacity. To return the original skin color and blend in the outer circumference of the Globe blend, the Hands snapshot had been set as the source for History. The Finger Detail selection would therefore only allow snapshot painting in the areas away from the fingers.



10 In this step, the Combo snapshot was selected as the History source and I painted back in some of the area I over-painted using the Hands snapshot. This is the interactive nature of snapshot painting that allows going back and forth between blend states by using the various snapshots as the source. While the whole image was looking pretty good, the last step was to zoom in and do some detail work to bring up the contrast and small textural detail in the image.




11 In these last stages, it's typical to bounce back and forth between the snapshots and blend out the final look of the color and texture. Selecting the Hands snapshot will return the area more towards the Hands snapshot while setting the Globe snapshot will bring more globe back into the image. If either produces undesirable results, you can regain the stage of the image where you made the Combo snapshot. In the final two figures you see the progression of the small detail being brought out. You should be warned that this process can be, well, addictive. At some point you need to call a halt and decide that enough is enough.



The wrap-up

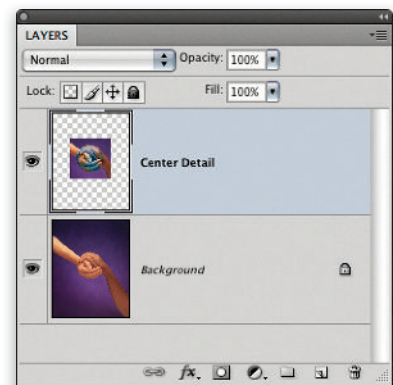
As you can tell from the preceding steps, this process is not for the faint at heart. However, the creative potential is simply too strong to ignore. There are some limitations to using History and snapshots; for example, History and snapshots are live only while your image is open in Photoshop. Once you save and close the image, all History steps and snapshots are lost. You can re-create them if you need (as long as you have the requisite elements saved as layers). You can also save out snapshots as discrete image files that can be reopened and added back into the final file as temporary layers to remake snapshots as needed. The final step in the HAND-DETAIL image is to return the results back into the main image.



12 After saving the HAND-DETAIL image the original full image was reopened and the CENTER DETAIL path was loaded as a selection ( **ctrl**-clicking loaded the path as a selection). The final HAND-DETAIL image was flattened (and closed without saving to preserve the layered image file) and with the selection active, I chose Edit ⇒ Copy and pasted the clipboard contents into the selection. By default, Photoshop's behavior is to paste into the exact center of an active selection. So as long as the pasted content and the selection were identical in size, I would have made a seamless assembly.

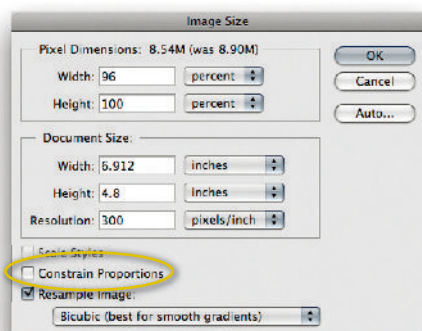


13 Pasting in the HAND-DETAIL image resulted in an exact pixel for pixel match. At this stage some final image adjustments were made to punch up the overall color and contrast and add the rough-edged frame around the final image. The end result is the appearance that the globe is painted onto the hands.

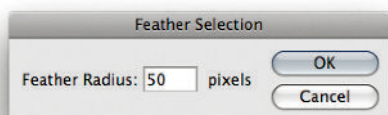


The Photoshop diet

You know how it's said that the camera adds ten pounds? Well, this is an easy weight-loss program courtesy of Photoshop (and you don't even have to go on a diet).

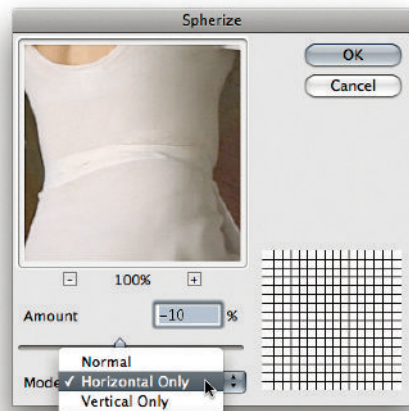


1 The first step is so easy, you'll kick yourself for not thinking of it yourself: non-proportional resizing. Simply uncheck the Constrain Proportions option (shown in the circle) in Image Size and enter in a reduced percent in the Width. This has the very simple ability to slim without any visible clue (as long as you keep to 4–8% maximum).



2 If the first step isn't enough, you can go to further lengths (or widths). The key thing here is to know that unlike most plug-in filters, Spherize actually works well even when a selection is feathered. In this step, an elliptical selection was made around the dancer's tummy and I chose Select ⇒ Modify ⇒ Feather and feathered the selection by 50 pixels.

3




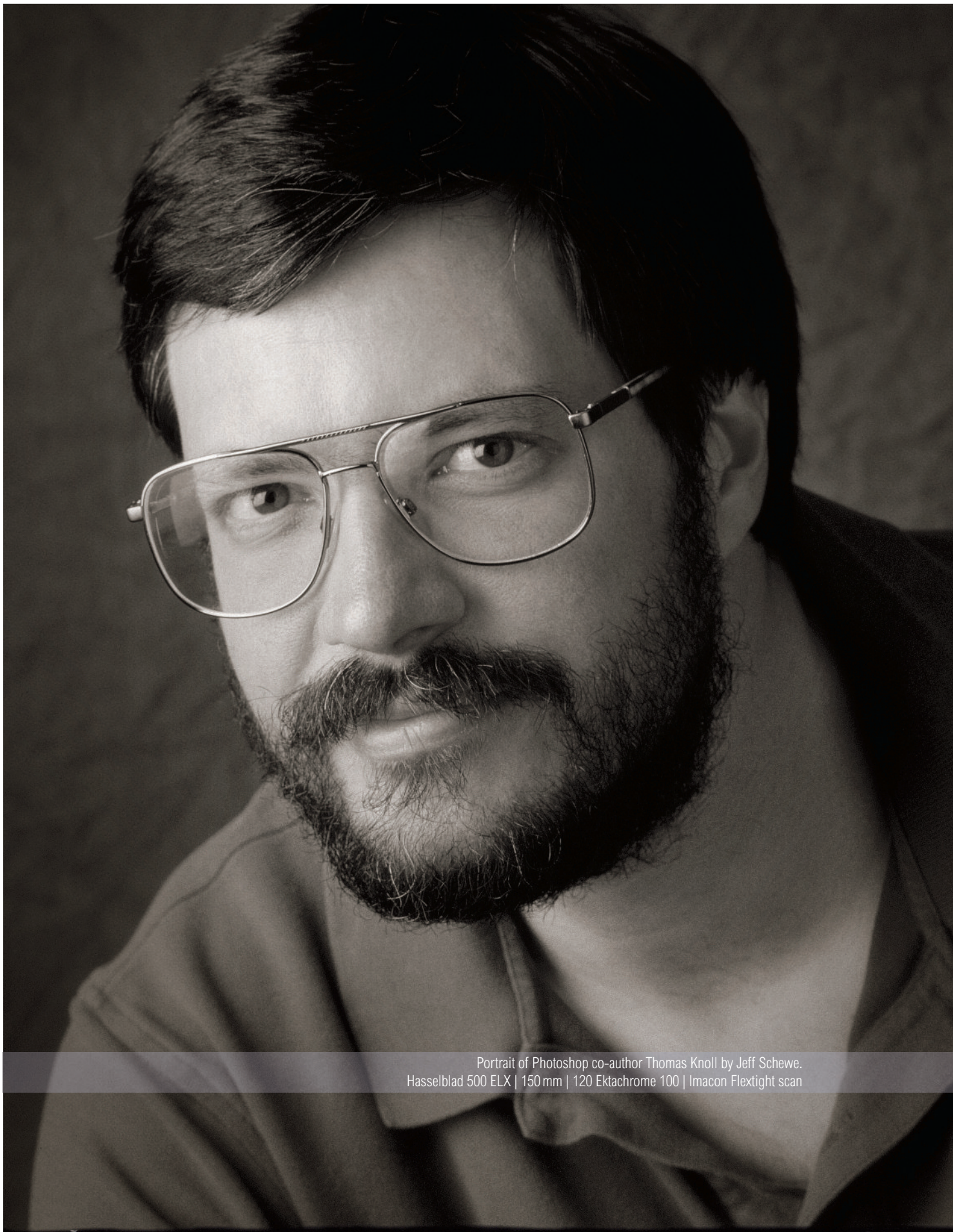
This shows the result of a single pass of Spherize.

3 With the feathered selection active, I chose Filter ⇒ Distort ⇒ Spherize, entered a -10 amount and constrained the effect to the horizontal axis only. You can try to do a normal Spherize but this will sometimes draw the effect somewhat too strongly, giving a pinched look. Moderation is the key here (similar to your actual diet).

4



4 At this stage, both the non-proportional resize and two passes of -10 horizontal spherize had been applied (I added a second pass by using the  **F** *ctrl* **F** keyboard shortcut). However, I really must caution against overuse of this effect. You can too easily move from subtle to a cinched waist look that would be outlandish.



Portrait of Photoshop co-author Thomas Knoll by Jeff Schewe.
Hasselblad 500 ELX | 150 mm | 120 Ektachrome 100 | Imacon Flextight scan



Chapter 6

Retouching people

Tips for retouching portraits

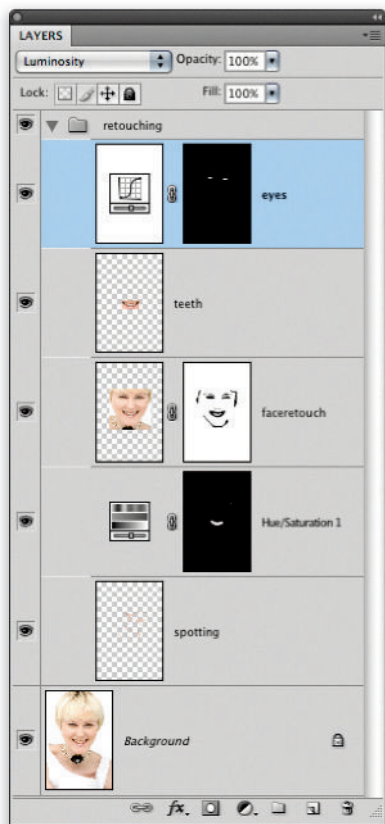
This chapter is all about how to retouch portrait photographs and shows some of the retouching tips we both use when working in Photoshop.

The key to good retouching is to do so in a way that it isn't noticed in the final image. Here, we have shown examples of ways to disguise your retouching to make the work that's done less noticeable, plus one example that isn't quite so subtle!

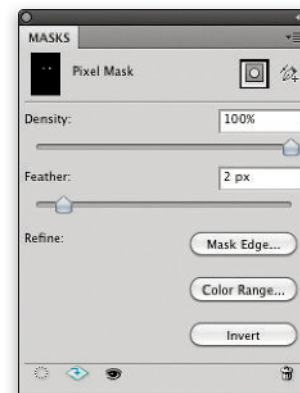
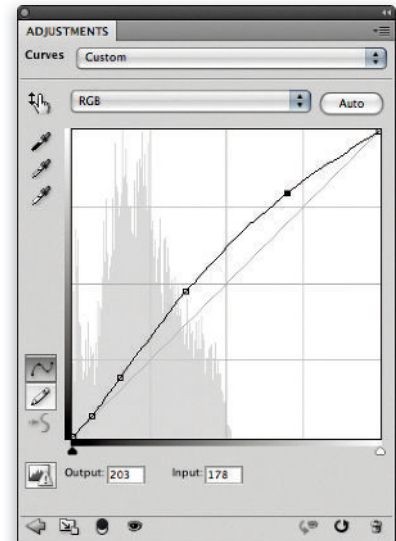
Fashion and beauty retouching

Adding lightness and contrast to the eyes

If you lighten the eyes too much they will look unnatural. Worse still, if you make them too white, the whites of the eyes will appear without any detail on the page and print as paper white. I use a fairly simple method for lightening the eyes, which is shown here. Of course, you could just select the whites of the eyes and lighten these areas on their own. That works too, but I find that by applying a Curves adjustment to the whole of the eye area, I can use the curve to anchor the brightness of the iris and tweak the curve to make the whites of the eyes lighter. This is just as effective as selecting the whites only but I find I have simultaneous control over the lightness of the pupils as well as the whites of the eyes.






1 To add more contrast to the eyes in this photograph, I selected the lasso tool and drew a selection around the outline of the left eye. I then held down the **Shift** key to draw around the right eye and added this to the lasso selection.



2 I was then able to apply a direct Curves adjustment (or add a Curves adjustment layer) and draw a lightening curve to add lightness to the eyes but keep the tone in the dark areas of the pupils the same. If you look at the curve shown here you can see how I placed an anchor point near the bottom of the curve to anchor the brightness for the pupils and then added extra points to lighten the pupils and whites of the eyes. Once I had done this I needed to feather the selection area, which I did by going to the Masks panel and setting the Feather amount to 2 pixels.

Repair work using a copied selection

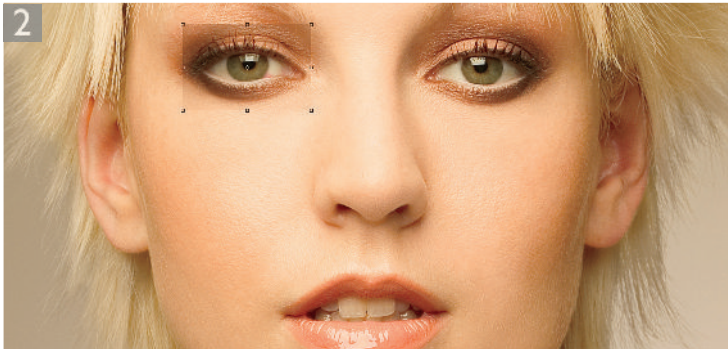
We typically use the clone stamp and healing brush to carry out most repair work but there is another approach you can use, which is to copy a selection of pixels that have been sampled from another part of the picture (or a separate image even). Back in the mists of time before there were layers in Photoshop, you could duplicate a selection to make it a temporary layer by  **alt**-dragging inside a selection with the move tool. Well, you can still do this in Photoshop, but you will usually find it more practical to copy the selection contents as a new layer. To do this make a selection and then use Layer ⇨ New ⇨ Layer via Copy, or use the keyboard shortcut  **J**  **J**. This will copy the selection contents as a new layer. Once you have duplicated the selection contents as a new layer you can use the copied layer to cover up another portion of the image by dragging it across with the move tool and transforming the layer as necessary.

In the step-by-step example shown here, I wanted to cover up the burst blood vessels that could be seen in the model's right eye. To do this I made a simple rectangular selection over the good eye, copied the contents to a new layer and transformed the new layer by flipping it horizontally. The add layer mask step is important because when you add a layer mask and fill or paint with black, you are not deleting the image data but merely hiding the layer contents. In this example the layer mask allowed me to initially hide all of the copied layer and (with white as the foreground color) selectively paint back the bits that I wanted to reveal. This allowed me to paint with the brush tool to replace the bloodshot areas of the eye with the copied selection from the good eye. One of the things you have to be careful of when retouching the eyes in this way is to make sure that you preserve the catch light reflections in the eyes, because if you were to flip the catch lights as well your subject could end up looking cross-eyed!

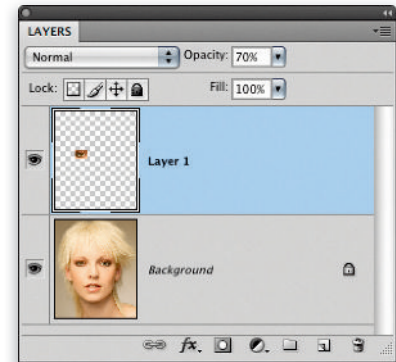
Registration is important too. One way to achieve this is to temporarily take the layer opacity down while you are moving a layer into position. The other thing you can do is to switch the layer blend mode to Difference. The effect this has is to cancel out any areas that are identical and display them as black. The Difference blend mode is therefore ideal when exact pin-registration is required when moving a layer.



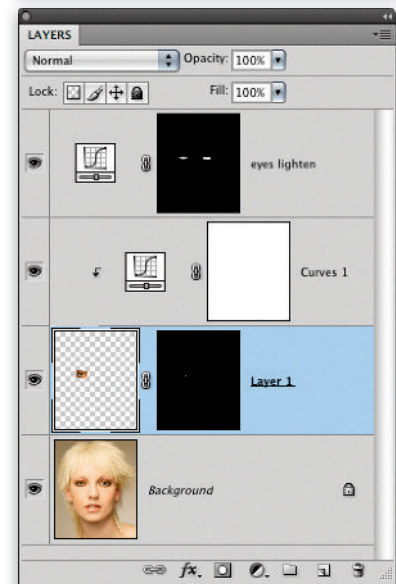
1 In this close-up view you can see that the model's right eye has some burst blood vessels. Fortunately the model is looking straight to camera and I was easily able to make a repair by copying across pixel data from the good eye.



2 I made a selection of the other eye and used the **⌘ J** **ctrl J** shortcut to copy as a new layer, and then used Edit ⇒ Transform ⇒ Flip Horizontal to match it to the other eye (with the opacity temporarily lowered to 70%).



3 I then **⌘ alt**-clicked the Add Layer Mask button to add a filled layer mask to 'hide all' on the layer. I selected the paint brush and with white as the foreground color gradually painted back in the good eye layer to repair the bloodshot area. Finally, I added an eye lightening Curves layer as described on pages 168–169.



Locking brush attributes

If you click on the lock icons in the Brush panel next to the brush attributes such as Shape Dynamics, you can lock these brush attribute settings so that these stay fixed whenever you choose a new brush preset.

Removing stray hairs

When I shoot for fashion and beauty clients I do all I can to make sure the hair is looking good at the capture stage. Even so, there will always be some stray hairs that need tidying later in Photoshop. The healing brush is great for most retouching tasks, but is not ideal when painting up against areas where there is a sudden change in tone. Therefore, in most instances I find it preferable to retouch loose hairs using the clone stamp or brush tool. Having said that, you can now in Photoshop CS5 make use of the spot healing brush in Content-Aware mode to more effectively remove stray hairs that cross over other hairs. The thing is, this feature doesn't really know which hairs you want to get rid of and which you want to keep, so while it is now a more effective tool to use, you can't rely on it completely, without helping guide the tool as you paint.

I always use a Wacom pen stylus and use a custom brush setting where the brush size is a round brush with a size of around 10 pixels, with the brush size and brush opacity linked to the amount of pressure that's applied. I have found this to be a useful brush setting for cloning hair strands and painting new strands of hair (see Figure 6.1). The brush size can then be modified and made larger or smaller using the square bracket keys on the keyboard. Using the clone stamp or brush tool in this way I can clone out cross-hairs, remove intricate strands of hair and paint new strands that match the texture and color of the existing hair.

If you are retouching fine strands of hair, pay careful attention to where the strands of hair originate, the direction they are flowing in and where they meet up with or cross over other strands of hair. A clumsy retoucher may simply lop off loose strands and such retouching always stands out as looking retouched (see Figure 6.2). When I am asked to tidy up fluffy loose hairs, I usually approach this type of task in gradual stages – gradually thinning out the hair rather than cutting it all off at once. This is because it would look unnatural to see a soft textured hairstyle suddenly change into a perfectly smooth outline. To keep the hair looking real I'll often leave some stray hairs in the picture. Sometimes I will begin by erasing the loose hairs around the hair outline and actually paint in some loose stray hairs afterwards (using the clone stamp tool configuration shown in Figure 6.1). Doing so enables me to achieve a more natural look to the hair.

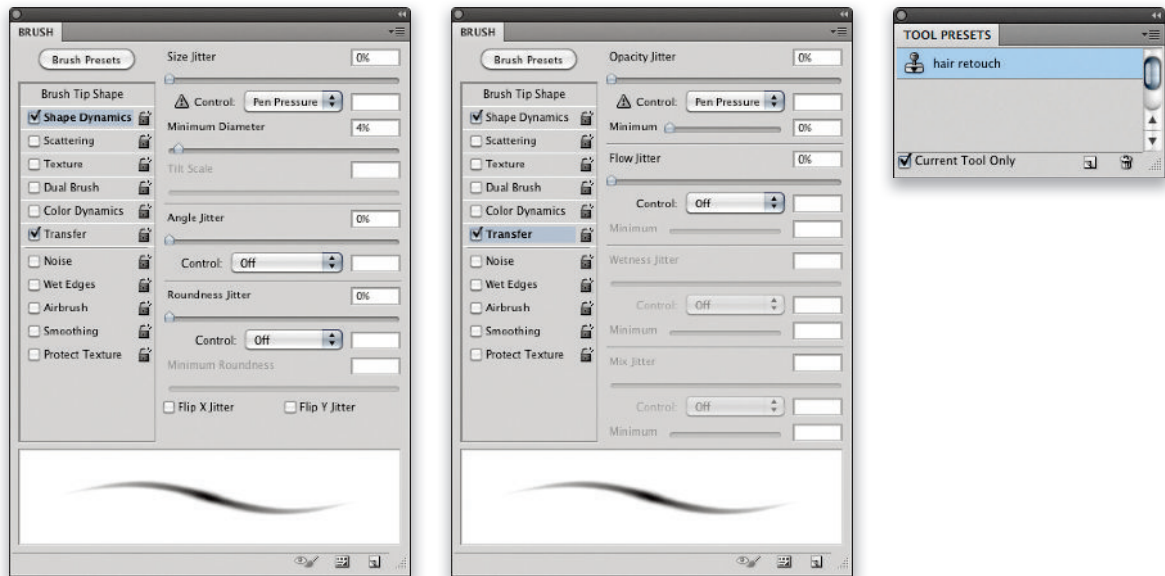


Figure 6.1 When using the clone stamp tool to retouch hair strands, I use a special preset setting. The brush size is set to 10 pixels and the Shape Dynamics and Transfer (Opacity) are linked to the pen pressure of the Wacom pen. I then save this combination of settings for both the clone stamp and the brush tool as a 'hair retouch' brush setting.



Figure 6.2 On the left here we have the original unretouched image and in the middle a crudely retouched version where all I did was to clean up the outer edge of the hairline. The version on the right shows the result of a more detailed hair retouch where I carefully removed every loose strand of hair and filled in some of the gaps, all using the brush and clone stamp tool and the settings shown in Figure 6.1.

Pressure-sensitive pen and pad

I do much of my beauty retouching using the brush tool on this copied layer. I prefer to use a pressure-sensitive stylus and pad such as the Wacom™ Intuos™, because this allows me a much finer degree of control than I can get with a normal mouse. Whenever you select any of the painting tools you can select from a number of options from the Brush panel that will enable you to determine what aspects of the brush behavior will be governed by the way you use the pressure-sensitive stylus. Photoshop will not just be aware of the amount of pressure you apply with the stylus. If you are using the Wacom™ Intuos™, Photoshop is able to respond to input information such as the barrel rotation of the stylus, the angle of tilt or the movement of the thumb wheel (if you have one).

Beauty skin retouching

There are many different types of skin and the skin texture varies a lot on different parts of the body. For example, the skin under the eyes will usually have a coarse goosebump texture and the cheeks may be slightly more pitted than the rest of the face skin and have larger pores. With younger subjects the skin on the forehead will generally be quite smooth, but with minute horizontal lines, and the smoothest skin texture of all will be on the temples and sides of the nose. As you move down towards the neck area the texture of the skin changes to become coarser still. In addition to this you may notice a very fine downy hair on the face, especially just above the lips. I mention this because it is important to pay close attention to these changes in skin texture as you retouch a beauty image. When you use the clone stamp or healing brush tools you need to carefully choose the source point you sample from when cloning skin texture from one part of the face or body to another.

Disguise your retouching

The basic rule when retouching is to disguise your work so that whatever corrections you make to a photograph, it is not immediately apparent that the picture has been retouched. If you are working for a fashion client they will usually be looking for image perfection. Although I may sometimes employ a lot of Photoshop wizardry in order to satisfy the client, I feel it is important to fade out the retouching so that I let some of the original blemishes and underlying skin texture show through still. My preferred approach is to retouch the skin using the clone stamp and healing brush tools to clean up all the blemishes. I then add a painting layer in which I use a large brush to paint over the skin to soften the details and unwanted shadows. As you will see in the beauty retouching example that's coming up, I always reduce the opacity of the layer that contains the brush paint retouching work to let much of the original, unpainted skin texture show through from below. The net result, I feel, is a more natural-looking finish, where the model's skin looks perfect, but without looking too artificial.

Brush blending modes

The painting and other brush-type tools can be applied using a variety of blending modes and these are the same ones as are available in the Layers panel, Apply Image and Calculations dialogs. Of the numerous blend modes available, I reckon that the following modes are probably the most useful when used with the brush or gradient tools.

The Screen blend mode can be used to lighten and I often use this as a brush blend mode to lighten areas such as the eyes, or add highlight sparkles, as shown on pages 110–113. The Multiply blend mode basically darkens and this can be used to selectively darken specific features, sampling colors from the photograph as I paint. For example, I sometimes use a large, soft-edged brush set to a low opacity in order to gently build up more density in the eyebrows.

As an assistant, I used to work for a photographer called James Wedge who was well known at the time for his hand-colored black and white photography. He produced some rather beautiful work in which he would carefully mask areas of a picture and paint directly on the print using translucent colored inks. If you are working in Photoshop, the Color blend mode can be used to achieve similar types of results. More often, I find the Color blend mode is ideal for color correcting small color casts. For example, I sometimes use the brush tool in Color mode to get the skin tones to match the colors on other areas of the face or body, or to balance out the color seen in an uneven tan. Sometimes I find that caucasian skin tones can appear too red/magenta in the darker areas and clients will often ask me to make these match the skin color of the rest of the body. Again, this is another situation where the Color blend mode comes in useful.

The Overlay and Hard Light blend modes can be used to paint in contrast, while the Soft Light blend mode can be used (as was shown in the ‘Coloring hair roots’ example on pages 146–147) to paint in a soft contrast effect. In Chapter 7 I will be showing how the brush tool can be used in Overlay blend mode to clean up a silhouette mask while preserving important edge detail.

As you will see in the beauty retouching steps on the following pages, I also use the Lighten and Darken blend modes whenever I use the brush tool to smooth out the skin tones on a beauty photograph.

Beauty/fashion retouching

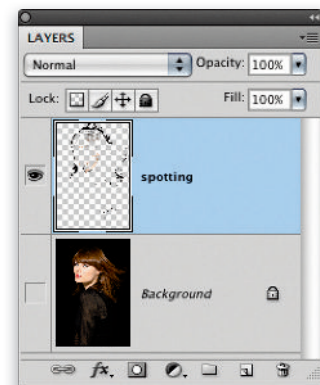
Fashion and beauty retouching is usually driven by the commercial requirements of clients, who in today's market will normally want every photograph that appears in print to have some level of retouching done to it. Photoshop has played a huge role in giving photographers the digital tools they need to retouch their own pictures. Yet, in the wrong hands this can lead to some truly dreadful photography! Over the next few pages I have shown all the steps I would use in a typical retouching session, where the objective was to clean up all the stray hairs and blemishes yet leave the model still looking human at the end of the process.

1 This shows the before version image without any retouching. As you can see, there were a lot of stray hairs to tidy, some spotting required on the black outfit and the skin tones needed to be made smoother.



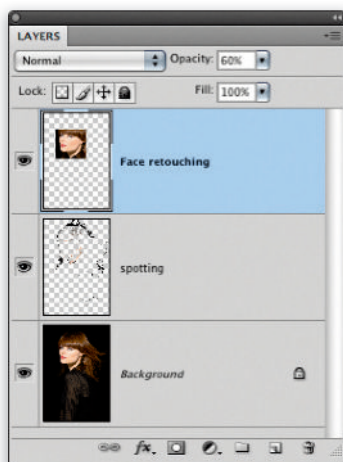


2 Before carrying out any retouching I added an empty new layer above the Background layer and set the tool options for the clone stamp and healing brush tools to Current Layer & Below. I was then able to carry out all the main spotting work on a separate layer. This meant that should I need to undo any of the retouching it would be easy enough to erase the bits that I didn't want included. There is also another benefit to doing this: you can **alt**-click on the spotting layer eyeball icon to reveal the retouching layer only and use this to show how much spotting work had to be done (see the bottom screen shot example where the spotting is revealed against a transparent backdrop). This might be handy if the client starts asking why you have charged so much to work on a picture!



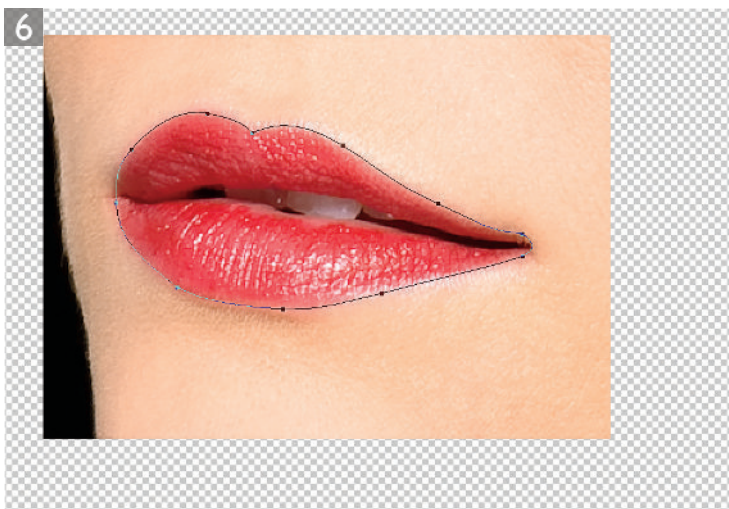
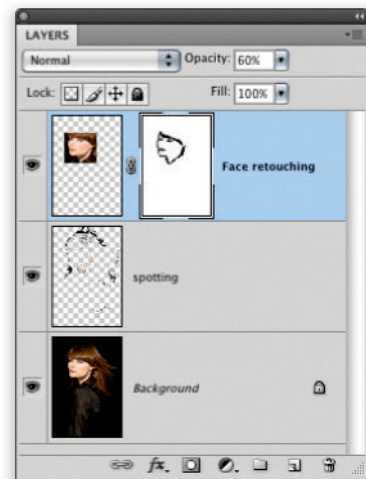
3 Next I wanted to concentrate on retouching the face. To do this I made a marquee selection of the face and neck and used the **⌘ Shift E** **ctrl alt Shift E** shortcut to create a new merged duplicate layer above the spotting layer. I then inverted the selection (**⌘ Shift I** **ctrl Shift I**) and hit the **Delete** key to delete the selected area. This left a merged copy of the selected area as a new layer, which I named 'Face retouching'.

4 I now used the brush tool to paint over the pixels on the Face retouching layer. For example, I began by painting with the brush tool in Lighten mode with a low-opacity brush (or ideally a pressure-sensitive pad and pen). I sampled a light flesh tone color by **⌘ alt**-clicking on the image and then brushed lightly over the darker areas of the face such as underneath the eyes (when using Lighten mode only the pixels that are darker than the sampled color will be replaced). I also switched to Darken mode, which allowed me to sample a flesh tone color to paint the lighter colored pixels darker (it is a good idea to always keep resampling new colors as you paint). It doesn't matter that I overdid the retouching at this stage, as the next step could be used to moderate the level of retouching. The main goal here was to smooth the skin tones and, if necessary, remodel the light and shade on the face.

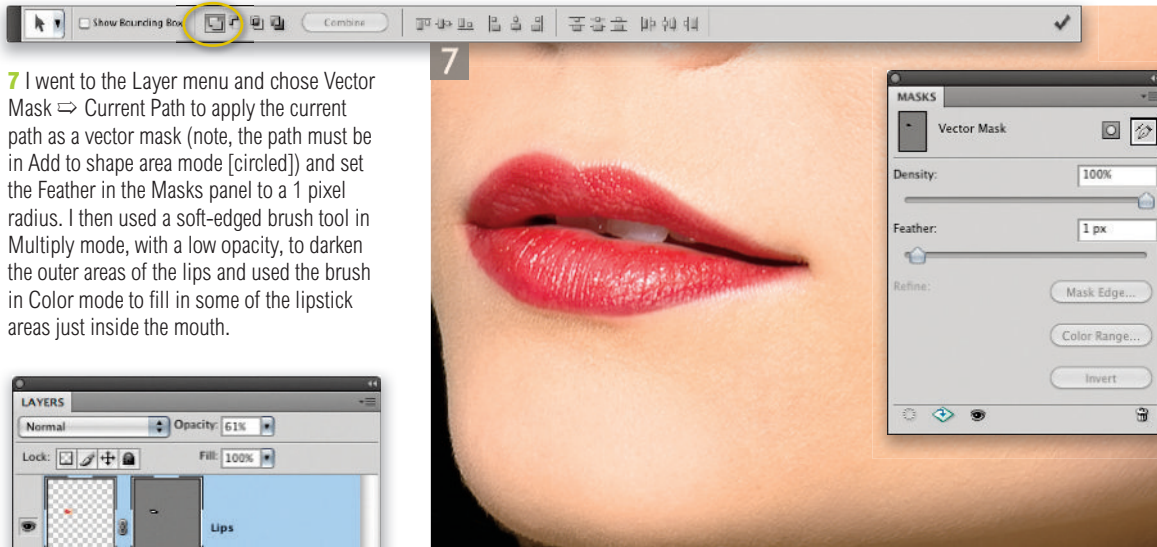




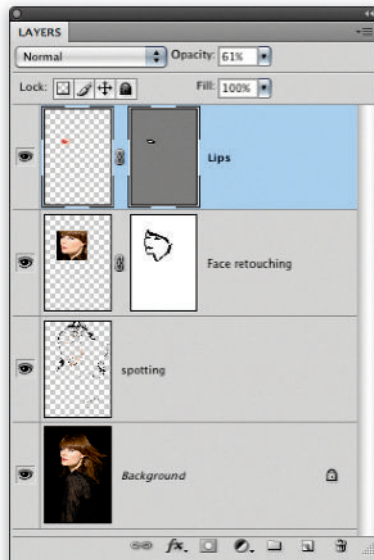
5 Some fashion photographers like the super-retouched look. Others argue that this makes models look more like plastic dolls than real women. It is up to you, but I usually prefer to fade the opacity of the retouched layer. In this instance I reduced the layer opacity to 60%. Doing this allowed more of the original skin texture to show through from the layers below so that the final retouched result looked more convincing. You will notice that I also added a layer mask to the layer and painted with black to hide the areas where the brush strokes overlapped important facial features (but don't forget to change the brush blend mode back to Normal).



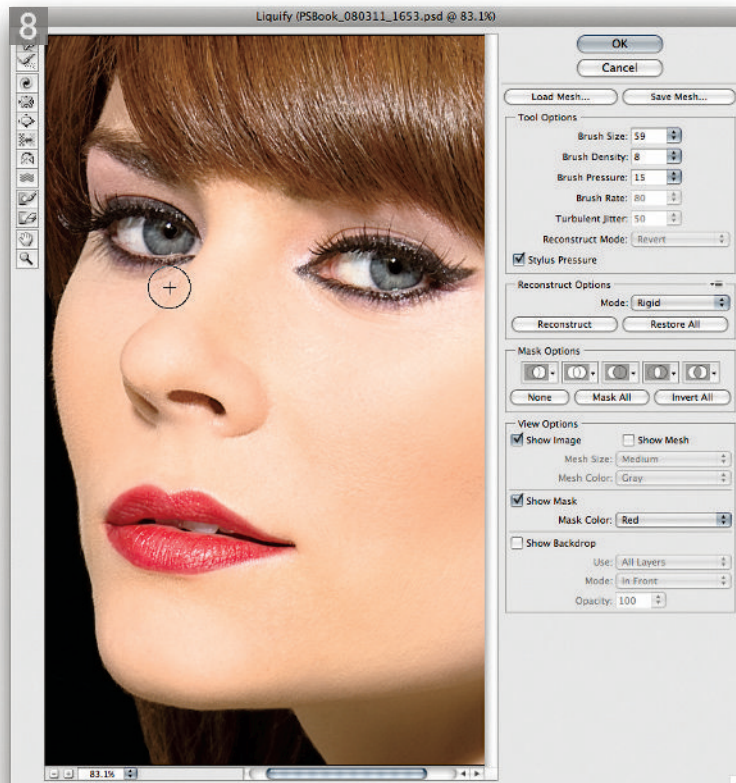
6 I next wanted to tidy up the lips. Here I used the same technique as in step 3, where I made a rough marquee selection of the lips area and used the **⌘⇧E** (**ctrl+alt+Shift+E**) shortcut to create a new merged duplicate layer above the Face retouching layer. I inverted the selection **⌘⇧I** (**ctrl+Shift+I**) and hit **Delete** to delete the selected area (this screen shot shows the Lips layer viewed on its own). I then used the pen tool to draw a path outline of the lips.



7 I went to the Layer menu and chose Vector Mask ⇒ Current Path to apply the current path as a vector mask (note, the path must be in Add to shape area mode [circled]) and set the Feather in the Masks panel to a 1 pixel radius. I then used a soft-edged brush tool in Multiply mode, with a low opacity, to darken the outer areas of the lips and used the brush in Color mode to fill in some of the lipstick areas just inside the mouth.

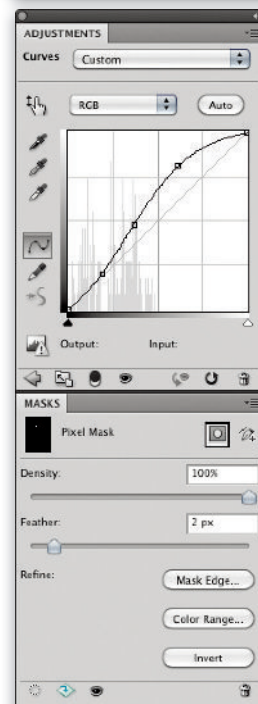
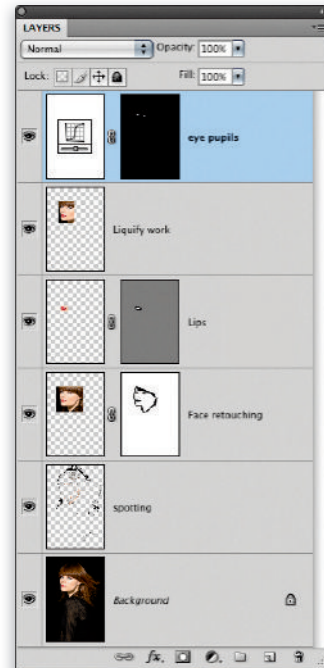


8 Once again I used the marquee tool to select the face area and used the **⌘+⌥+Shift+E** shortcut to create a new merged duplicate layer above the Lips layer, inverted the selection and hit **Delete**. I then **⌘+click**-clicked on the new layer (which I named 'Liquify work') and chose Liquify... from the Filter menu. As you can see here, I used a few gentle brush strokes with the warp tool to make the eyes slightly bigger, made the lips a little more symmetrical and straightened the fringe.





9 Here is the final version showing the results of the Liquify work that was applied in Step 8. I also made a lasso selection of the pupils and added a Curves adjustment to add more contrast and lightness to the pupils only. As you can see, I added a 2 pixel feather in the Masks panel to soften the mask selection edge. The important points to note here are that although the face has been retouched, the skin tones still show the texture of real skin and the layered structure of the master image allowed me to re-edit certain portions of the image as necessary. The Background layer at the bottom remained untouched throughout.



Retouching portraits

Beauty retouching is about enhancing the makeup and the smoothness of the lighting on the face. Portrait retouching requires a fairly similar approach for getting rid of the blemishes and enhancing the skin texture of the subject. However, overall, I find that portrait retouching requires a more subtle approach, as you don't always want to reduce the lines and wrinkles quite so much when retouching portrait photographs. Not all blemishes should necessarily be removed. Take the case of the model Cindy Crawford. In the early years of her modeling career, a lot of magazines wanted a mole on her face to be retouched out. Later on, as she became more famous, nobody would dream of removing it because the pictures would no longer be recognizable as being Cindy!

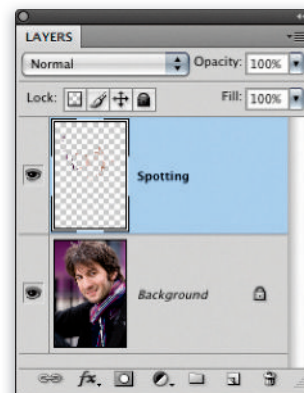
It is interesting how there has been quite a backlash in recent years, with many celebrities reacting against pictures where their faces (as well as their bodies) have been retouched out of all recognition. Our friend Greg Gorman is a well-known celebrity photographer and he tells us that he has made a deliberate effort in recent years to reduce the amount of retouching that is carried out on the portraits he shoots. Having said that, Greg reckons there are many celebrities who quite like seeing themselves retouched and are happy to believe that's how they really look. Plus many of the magazines simply won't publish photographs that feature models or celebrities unless they have had at least a moderate level of retouching done to the images. When Photoshop first came out we saw lots of magazine images where the eyes and teeth were the same white as the paper stock. As a fashion photographer I see lots of examples of badly retouched testing photographs in models' portfolios. My gut feeling is that the magazine editors as well as the general public are becoming tired of the over-retouched look and in recent years we have seen magazines tone down the amount of retouching used, or they are at least now using better retouchers to do the work. Over the next few pages I have shown an example of a classic portrait where the retouching is more restrained, which if anything requires even more skill to get right compared with the beauty retouching example I showed you earlier.

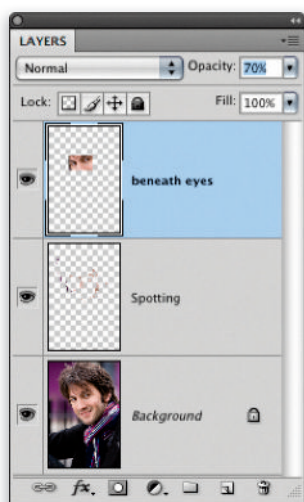


1 This is a portrait of Alex, one of the models used on our Photoshop book shoot, taken by Jeff. Here I wanted to show you the kind of steps that I would typically use to retouch a portrait. These steps are slightly different to the beauty retouching method described earlier because the main objective here was to make the retouching look as completely natural as possible.



2 I began by adding a new empty layer with which to carry out all the initial spotting work using the clone stamp and healing brush tools. If you compare this version with the one above you will notice that I was careful to retouch all the small blemishes and tidy up things like the stray eyebrow hairs and stubble. I didn't remove the mole on Alex's cheek, but I did remove many of the other spots that I felt needed to be retouched.

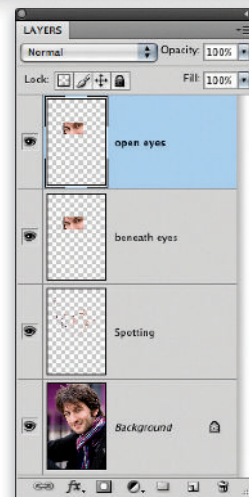


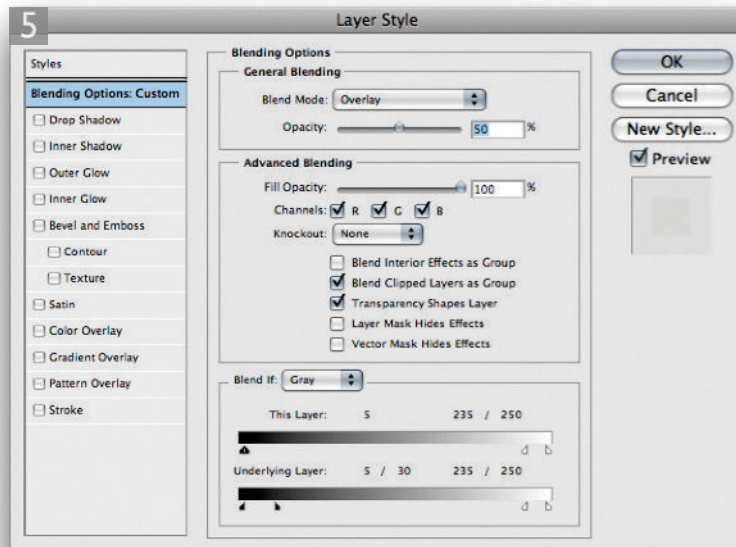
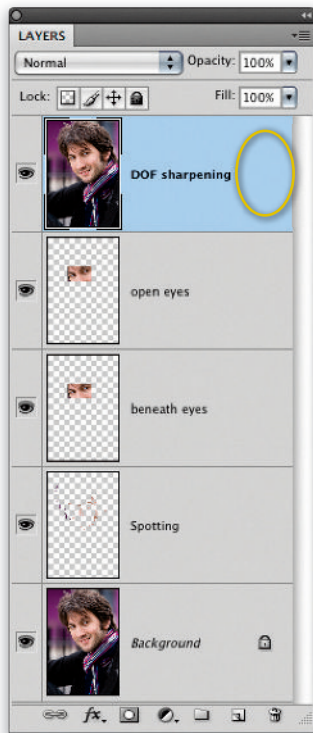


3 Next, I wanted to tackle the bags under the eyes. Even though a fill reflector was used to bounce some light into Alex's face, I felt it would be a good idea to knock these back a little further. To do this, I carried out the Merge copy layer step that was used in the previous retouching example. I used the rectangular marquee tool to select the eyes only and used the **⌘-Shift-E** (**ctrl+alt+Shift+E**) shortcut to create a new merged duplicate layer above the Spotting layer, inverted the selection (**⌘-Shift-I** (**ctrl+Shift+I**)) and hit **Delete**. I now had a merged copy layer of the eyes at the top of the layer stack. I selected the healing brush and used it to carefully remove the crease line. The trick here is to be very careful choosing where you sample from. In this example I had to make sure that the heal cloned texture correctly matched the surrounding skin texture. Once I had completed the healing brush work, I faded the layer opacity to 70% in order to let some of the bags and crease line show through. This avoided letting Alex look like his face had been pumped full of Botox.

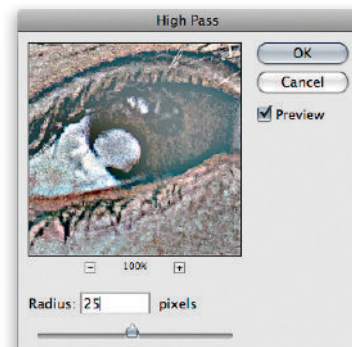
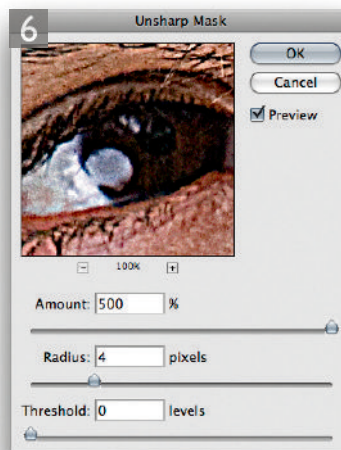


4 I now wanted to open the eyes slightly. If you look closely you can see a reflection of the fill light reflector that was used to bounce more light into Alex's face. The downside of doing this is that his eyes were slightly squinted. To counteract this I repeated the Merge copy layer step, where once again I made a marquee selection of the eyes and used the **⌘+Shift+E** (**ctrl+alt+Shift+E**) shortcut to create a new merged duplicate layer above the 'beneath eyes' layer, inverted the selection and hit **Delete**. I then went to the Filter menu and chose Liquify... In the Liquify dialog shown here I used the warp tool with a low Brush Pressure setting to gently push the lower eyelids open a little more. It was a rather subtle adjustment, but all that was needed to make the eyes look more natural.

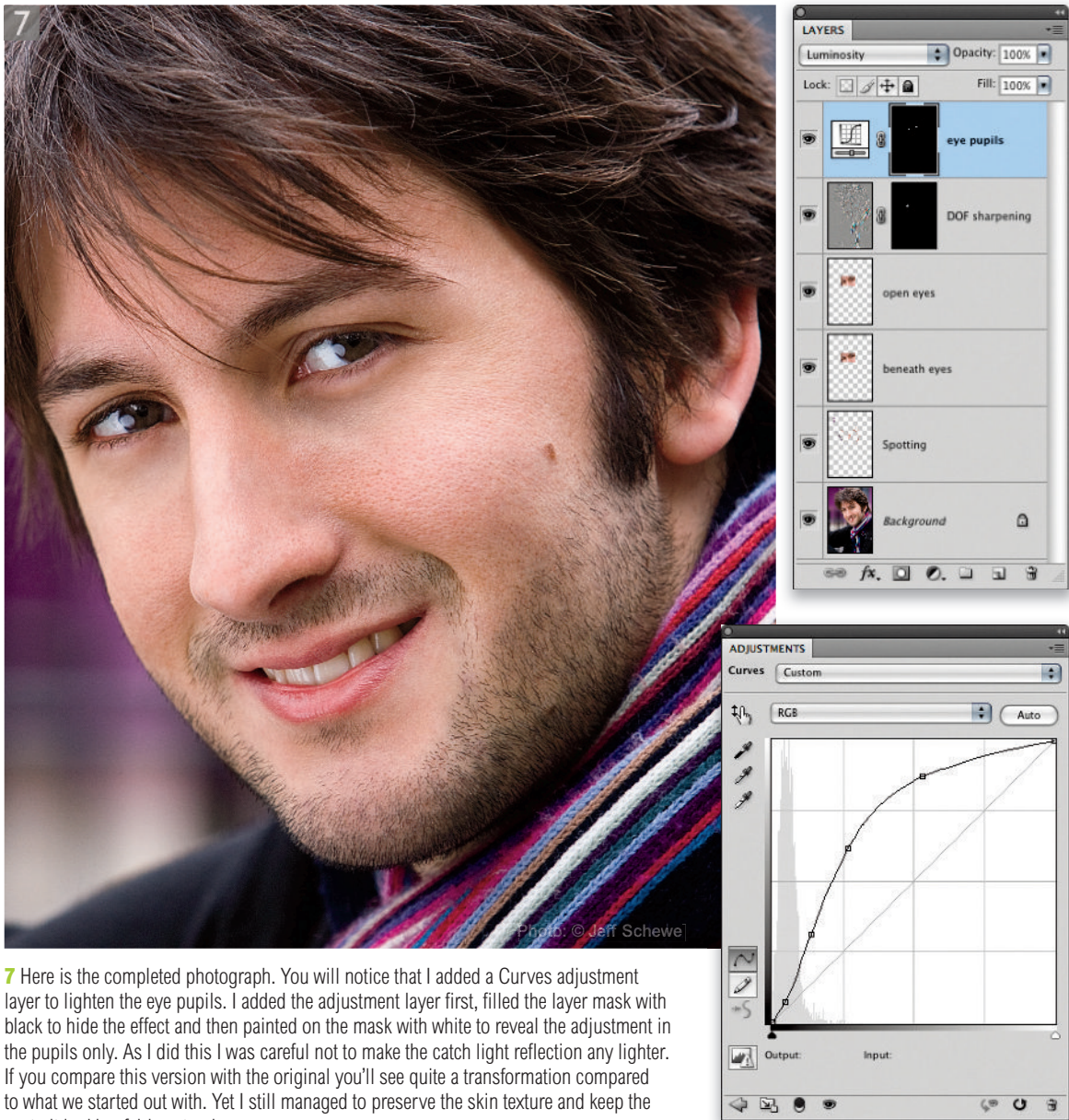




5 I now wanted to make Alex's right eye slightly sharper. To do this I used a technique first devised by Bruce Fraser to create a depth of field sharpening layer. The first step was to create a new merged copy layer using the **⌘+⌥ Shift+E** / **ctrl+alt+Shift+E** keyboard shortcut. I then double-clicked on an empty space in the layer (circled), to open the Layer Style dialog shown here, where I set the layer opacity to 50%, the blend mode to Overlay and adjusted the Blend If sliders as shown here.



6 I went to the Filter ⇒ Sharpen menu and applied the Unsharp Mask filter to the merged copy layer using the settings shown here, followed by the Filter ⇒ Other ⇒ High Pass filter using a 25 pixels Radius.

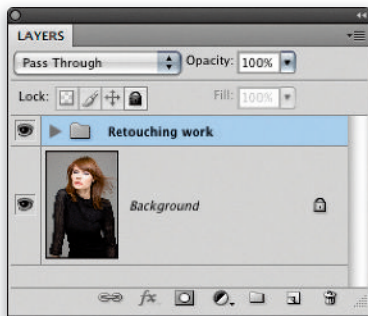


7 Here is the completed photograph. You will notice that I added a Curves adjustment layer to lighten the eye pupils. I added the adjustment layer first, filled the layer mask with black to hide the effect and then painted on the mask with white to reveal the adjustment in the pupils only. As I did this I was careful not to make the catch light reflection any lighter. If you compare this version with the original you'll see quite a transformation compared to what we started out with. Yet I still managed to preserve the skin texture and keep the portrait looking fairly natural.



Figure 6.3 Here you can see the lighting setup used to capture the photograph shown on this page.

1 This photograph was shot using a standard beauty light setup (see Figure 6.3), and shows the model with her normal hair color. In the following sequence of steps I want to show you how I was able to change her hair color using a precisely measured sample hair color swatch as guidance.



Hand coloring a photograph

One way you can colorize a photograph is to set the brush tool to the Color blend mode and set the foreground color to the color you wish to paint with. But here is a hand coloring technique that was originally devised by Jim Divitale as an ultra-flexible way to paint items a specific color. The way this works is that you pick a foreground color and then add three color fill layers of this same color, but using three different blend modes: Color, Overlay and Multiply. Color essentially colorizes the image, the Overlay blend mode applies color to the image as well, but also adds contrast, and lastly the Multiply blend mode adds color depth by adding color and darkening at the same time.



2

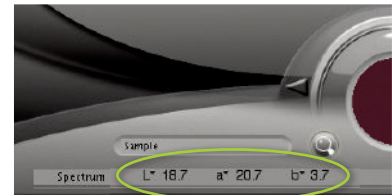


2 For this first step I used an X-Rite Eye-One spectrophotometer to take a series of measurements from selected hair color swatches in a hair color guide book.

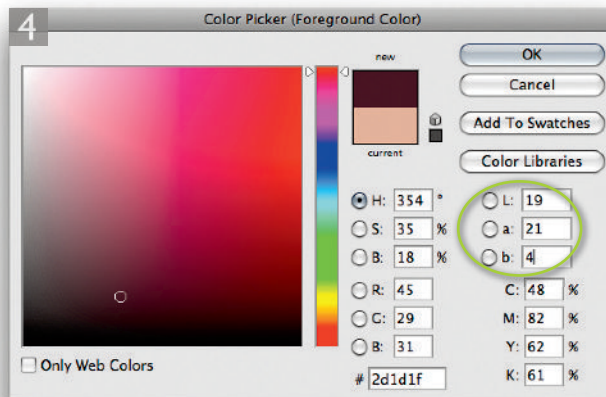
3



3 I used the X-Rite Eye Share software to record the measurements made with the Eye-One device. I took several measurements of the desired hair color sample and clicked on the resulting sample swatch colors in the Eye Share interface to calculate the best average color reading (the color readouts were given in Lab values [circled below]).



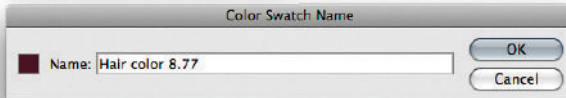
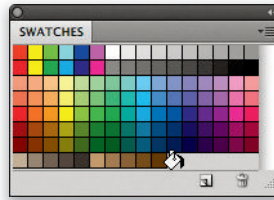
4



4 I then opened the Color Picker in Photoshop and entered the (rounded up) Lab Color values in the Lab coordinates boxes (circled). It isn't absolutely necessary that you go through the pre-step of measuring the color swatch values with a spectrophotometer. The following steps will work just as well if you simply resort to guessing the color here. Once I was happy with the settings, I clicked OK to make this the new foreground color.

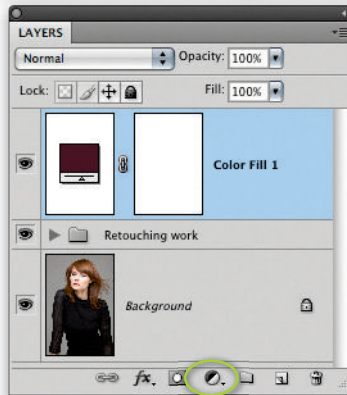
5 Next, I went to the Swatches panel and rolled the cursor down to the bottom of the list, where you'll notice how the icon changed to a paint bucket icon. I clicked here to add the foreground color as a Swatch preset, where I named it using the color reference from the hair swatch book in Step 2. Saving special colors like this in the Swatches panel can save you time if you need to reference such colors again.

5



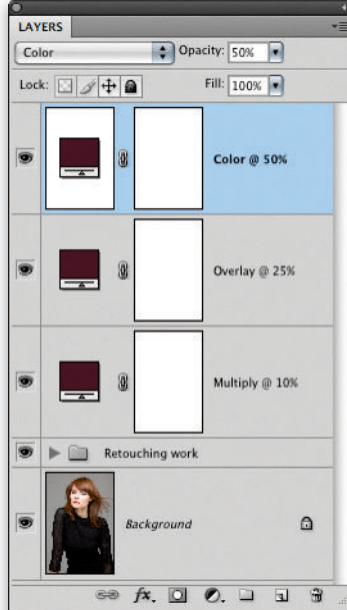
6 At this particular point, you might find it helpful to record the following steps as a Photoshop action. This way you'll find it quicker to set up all the layers in future without having to do so manually. The first step here was to click on the Add adjustment/fill button in the Layers panel (circled) and add a new Color Fill layer using the current foreground color.

6



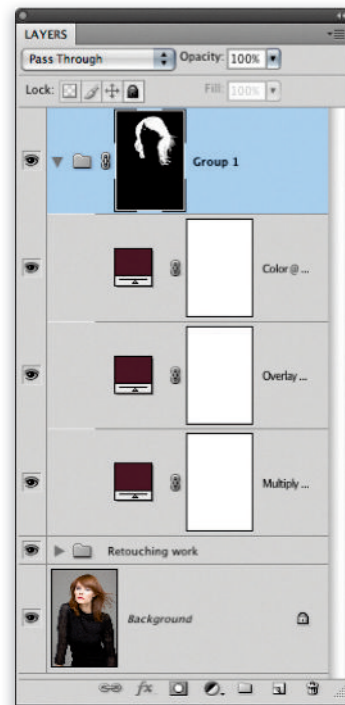
7 I then dragged the Color Fill layer to the New Layer button in the Layers panel to make a copy and dragged again to make a second copy. I set the uppermost Color Fill copy layer to Color mode using 50% Opacity. I clicked on the middle layer and set the blend to Overlay mode using 25% Opacity and lastly, I went to the original layer at the bottom and set the blend mode to Multiply using 10% Opacity. In the screen shot shown here, you'll notice that I renamed the layers, indicating the layer blend mode and opacity percentage. It is by no means essential that you do this, but if you are recording these steps in an action it may help if you identify the layers in this way.

7





8 I **Shift**-clicked to select all three Color fill layers and chose New Group from Layers... from the Layers panel fly-out menu (or use the **⌘G** **ctrl** **G** shortcut). I then **alt**-clicked on the Add Layer Mask button in the Layers panel to add a pixel layer mask filled with black, which hid the layer group contents (if you have been recording these steps as an action, you can now press the Stop button to end the recording). After I had completed these steps I was able to paint with white on the layer group's layer mask to simultaneously reveal all three layers in the group.



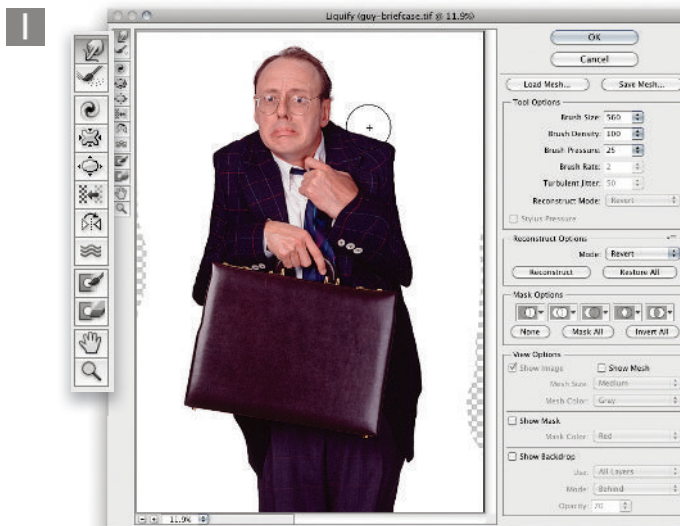
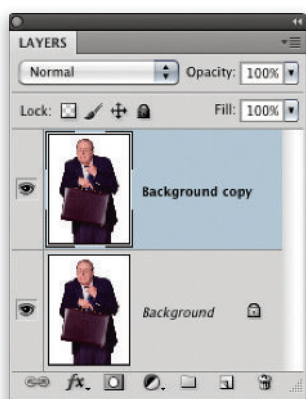
9 Here you can see the finished result after I had finished painting on the pixel layer mask to define the outline of the hair. The blend and opacity modes I suggested using for the three layers are a good starting point. When you try this method out on your own photographs you may well want to adjust the opacity settings for the subject you are coloring.

Working with Liquify

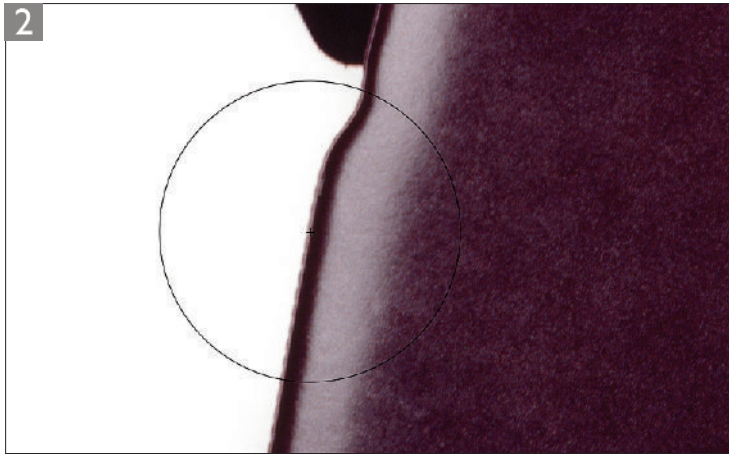
Liquify is Photoshop's answer to warping and distortion of photographic images. It's a free-form tool that takes some practice to become proficient but the results really can't be accomplished in any other manner. Martin tends to use the tool in very subtle ways, whereas I like to use Liquify to really make a difference. Figure 6.4 shows the result of before and after a Liquify session.



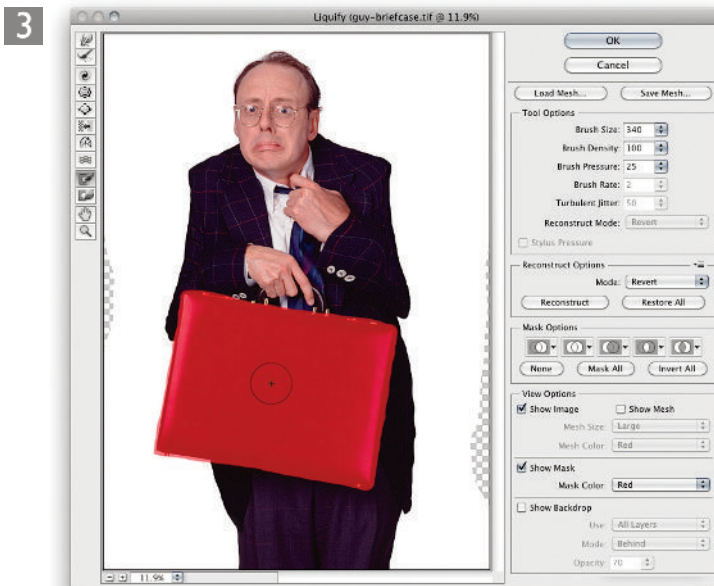
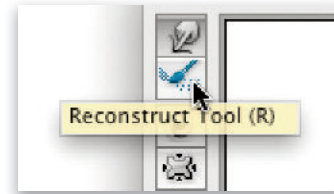
Figure 6.4 On the left is the original scan from a 120 mm transparency. The image on the right shows the final Liquify warp and crop.




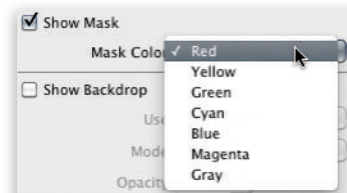
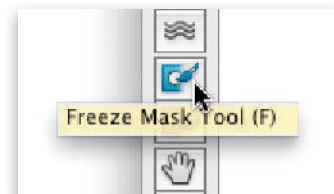
1 The first step was to take the *Background* layer and duplicate it so that the Liquify warp would be on its own layer. Then I opened the copy layer in Liquify. I used the forward warp Tool to start pushing parts of the image around. You'll note that I accidentally warped the briefcase. To fix that, I used the reconstruct tool in the next step.

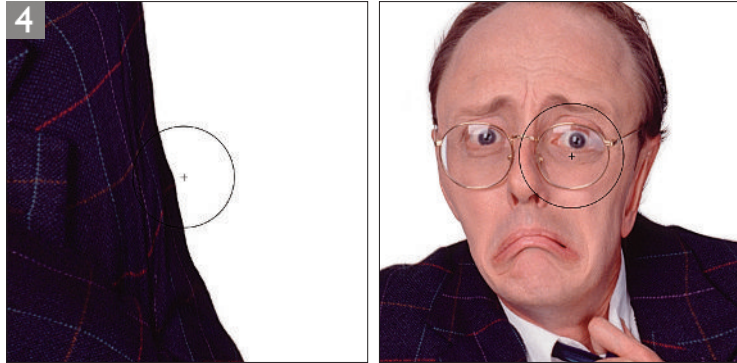


2 To fix the unintended warp, I used the reconstruct tool to literally paint back the unwarped image. To avoid unintended warping of the briefcase later, I created a mask in the next step to constrain the warping.

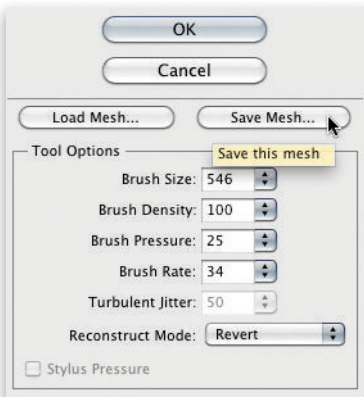


3 I used the freeze mask tool to paint a mask over the briefcase which would then allow me to make sure that regardless of the subsequent warping, the briefcase would remain unwarped. I chose the option to show the mask while I was painting it in. I also chose the Mask Color to be red for easy identification. Just underneath the freeze mask tool (really, I don't make this stuff up) which allows erasing of the mask. The easier alternative is to simply keep the freeze mask tool selected and use the  **alt** key to toggle to the thaw mask tool while painting.





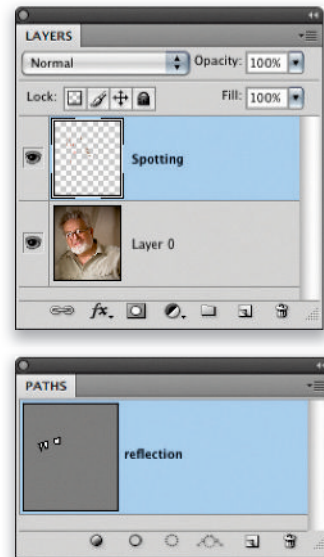
4 I then zoomed into the image to work on specific details. I used the forward warp tool (left) to smooth out areas of the guy's jacket and used the bloat tool (right) to make his eyes bigger. The intent was to add a degree of cartoonish character while still maintaining a believable appearance.



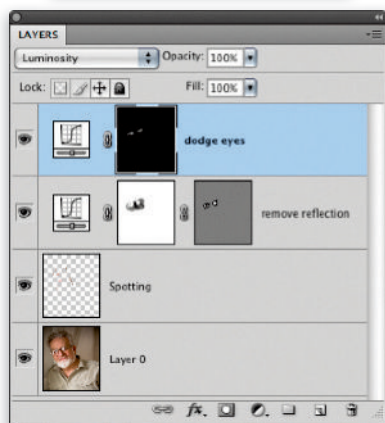
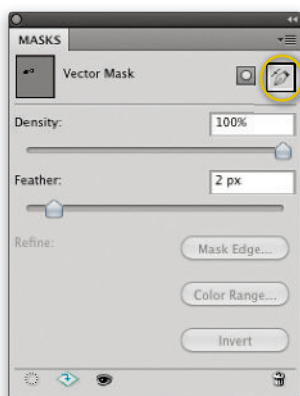
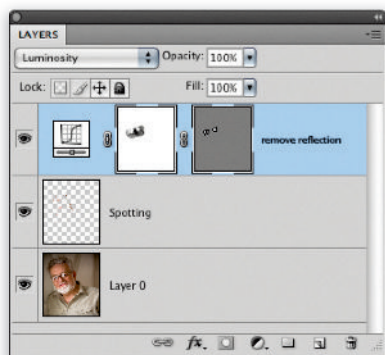
5 The final step before clicking the OK button was to save the warp mesh as a separate file. This would allow me to reopen Liquify and modify the warp down the road (always a good idea when working with art directors). So, did I go too far?

How to remove reflections from glasses

When you photograph people who are wearing glasses you often have to be careful to watch out for reflections. This isn't always such a bad thing as the reflections can sometimes add to the look of a portrait, but they are usually less desirable when they show a reflection of the studio lighting or are in other ways distracting. In the step-by-step example shown here the reflections aren't at all unpleasant, but I thought it would be useful to show you how one could go about dulling these down in Photoshop. Using the technique described here, it was possible to fade the adjustments made and find the right balance between the uncorrected and corrected versions.



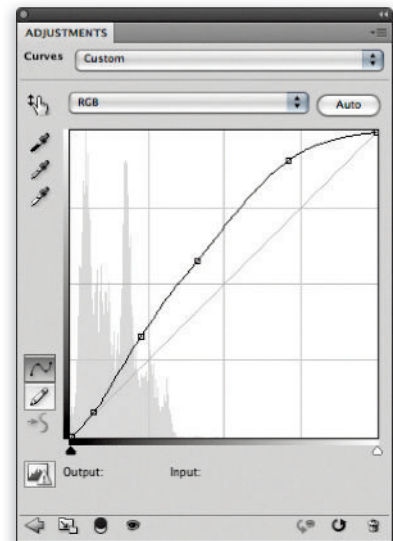
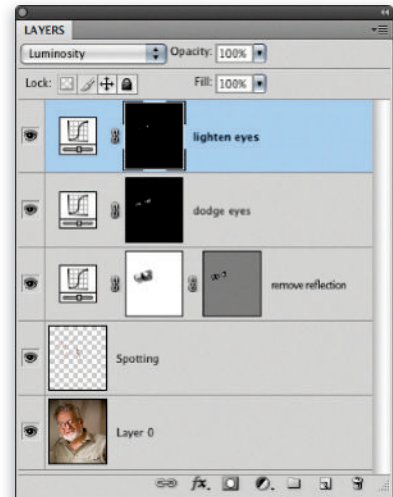
1 Here is a photograph, shot by Jeff, of Rod Wynne-Powell, who is the technical editor for this book. I began by adding a new empty layer and used this to carry out all the main spotting work. I then selected the pen tool in Path mode and used it to define the outline of the reflections, which you can see have been saved as a path in the Paths panel.



2 I then applied a darkening Curves adjustment layer and, with the path still active, clicked on the Vector path button in the Masks panel (circled). This applied a vector mask to the Curves adjustment mask using the path I created in Step 1 (if the vector mask appears inverted, follow the steps shown on page 180 to set the path mode to 'Add'). With the vector mask selected, I also applied a 2 pixel feather via the Masks panel to soften the mask outline. I then clicked on the pixel layer mask and used the brush tool to paint with black. This allowed me to further fine-tune the Curves adjustment masking.



3 The previous step left the eyes looking rather shaded. To address this, I added a further Curves adjustment – this time one that lightened the image. I filled the pixel layer mask with black and used the brush tool with white as the foreground color to paint on the layer mask and effectively dodge the areas inside the glasses to make them lighter.



4 Step 3 improved the photograph, but the eyes did now lack contrast. To complete the image, I added another Curves adjustment layer – this time a lightening adjustment that brightened the eyes. I filled the layer mask with black and used the brush tool with white as the foreground color to paint on the layer mask. My aim here was to mainly lighten the whites of the eyes, while preserving the darkness in the pupils.



Chapter 7

Masking and compositing

How to combine images and solve tricky problems

In this chapter we wanted to look at some of the various masking and compositing techniques that we have both utilized over the years. This is one of those areas where Photoshop has evolved to provide a useful array of tools that can help you to produce convincing blends in your composite images. Of course, it is not all down to Photoshop. It often matters that you get the photography right to begin with. The techniques shown here should provide you with ideas and inspiration for how to become a master retoucher using Photoshop.



Figure 7.1 The two top shots were done on location at the Case dealer. The sign was done in Photoshop and the sunset was from studio stock.

Compositing work

Creating a realistic composite

In a perfect world where sunsets appear on cue and clients really do read (and send) memos, you don't need to worry about putting together a complicated production shot – it all falls magically into place. But in the real world, that rarely happens. This is an example of how the best laid plans indeed go awry and how you can use Photoshop to construct the image you need in spite of client miscommunications and weather that doesn't play nice.

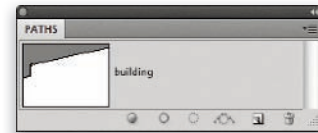
In this instance, the art director promised me that he had seen the scouting shots of the Case IH dealer and it would work well as a nice dusk shot – and the building exterior even had shrubs (for some reason, he really liked those shrubs). However, the dealer did not get the memo for clearing out *that* particular bay of the building. The bay with the attractive shrubs had a Case IH Combine that was in about a thousand pieces. So, we were forced to shoot the big machine around the back of the building while we set up the exterior shot for dusk at the front side with the shrubs. Oh, and the sign, it seems that hadn't been manufactured yet so I wouldn't be able to shoot it, could I just make the sign in Photoshop? Sure...

This ended up being a far more complex composite than was originally planned. Figure 7.1 shows the two original shots and the synthetic sign element created from scratch in Photoshop. The key was to shoot both the interior and exterior shots from the exact same camera angle and camera height – even taking the steps of measuring the distance and the angles to be accurate.

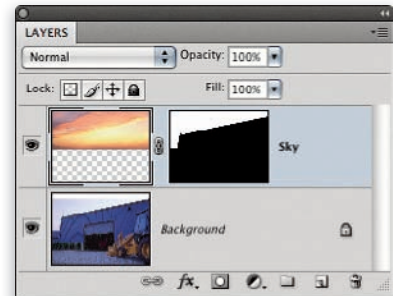
The exterior dusk shot was done first with the timing aimed to get the right dusk light. The art director had hoped for a nice sunset (yeah, like that would happen). The sunset was visually uninteresting so the art director agreed we would need to use a stock shot. I had shot a bunch of really nice sunset photos in Montana earlier in the year while on assignment for Case. While they didn't use the sunset shot for that assignment, they did license the sunset for this one. The inside of the bay on the back side of the building was lit while waiting for the outside light to get right and shot later at night – it was a long night too!



1 The first step was to use the pen tool to draw an accurate path around the building exterior that would be loaded as a selection, saved as a channel and then into a layer mask for the sky layer. When the sky layer was brought in I resized it to fit the full width of the image. You'll note in the Background layer, I had to add more canvas to the top in order to fit the layout. The sky covers that addition.



Paths panel showing building outline



Layers showing sky and layer mask



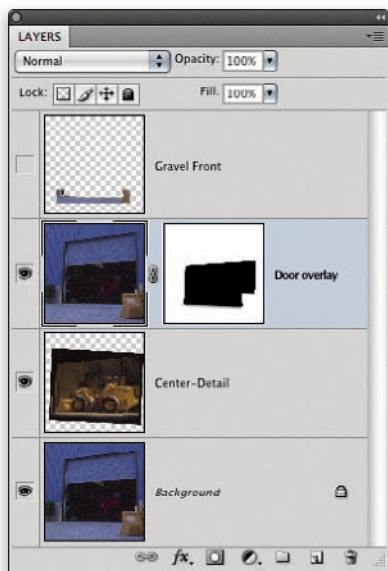
2 To avoid working with the entire document when doing the center detail work, I used a process described on pages 150–151 and worked on this section of the image separately. Even after careful measurements when shooting I still needed to do a bit of Free Transform work to get the interior shot sized and positioned. Rather than apply a layer mask to this layer I made a duplicate of the Background layer and moved it to the top of the layer stack and masked it (as you'll see in the following step).



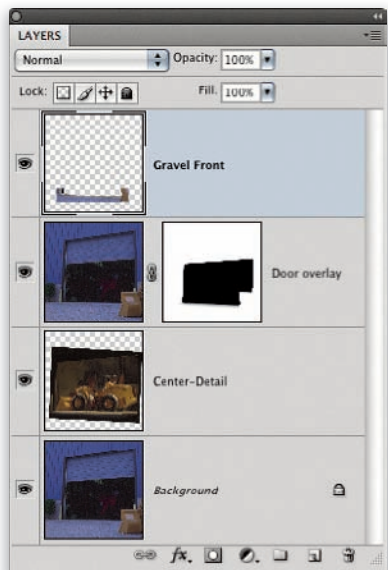
Layers showing detail of the two layers



Door outline channel



Layers showing Door overlay layer



3



3 It may seem backwards, but I often prefer to overlay a layer on top of something and then use a layer mask to reveal what's underneath. I find it more expedient to work this way. The layer mask was done using the pen tool to create an outline of the door opening with some softening done in the foreground to allow some of the warm light to spill out. Not enough in this case, which leads to the next step.

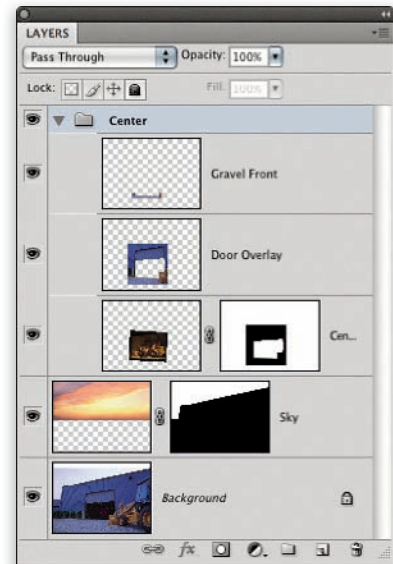
4



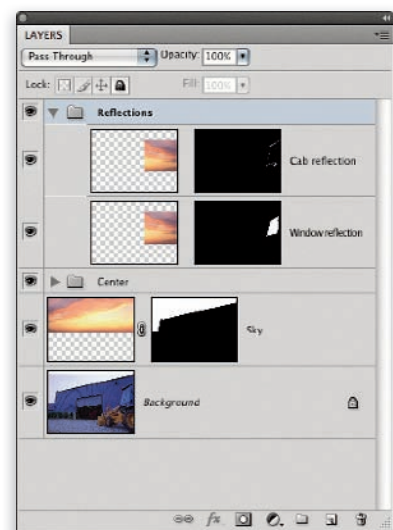
4 In order to get more warm light extending out of the doorway, I added a layer copied from the background and lightened it and added a warmer color balance.



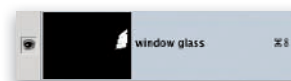
5 Going back to the main image, I dragged and dropped the three sub-layers (I didn't bother with the Background layer) and added them to a layer group named 'Center'. Since I had added a new sky to the photo and the original reflection in the tractor's glass window was of the 'as shot' sky, I needed to fix that.



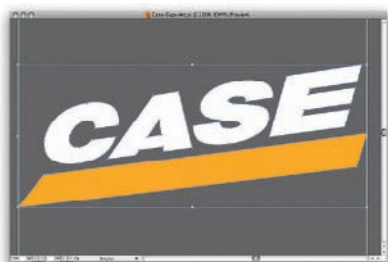
6 I copied the far upper left portion of the sky and made it into a new layer. I then used Edit ⇒ Transform ⇒ Flip Horizontal (since the reflection was a 'mirror image' from that portion of the sky). For the window glass channel, I used the pen tool to create an accurate outline of the glass in the window and loaded the channel as a selection to create the layer mask. You'll note a second reflection was added – since the shiny parts of the cab also reflected the original sky I repeated the process by duplicating the flipped sky and used a different layer mask created using Color Range.



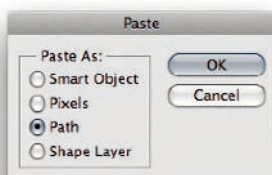
Layers showing Reflections group of 2 layers



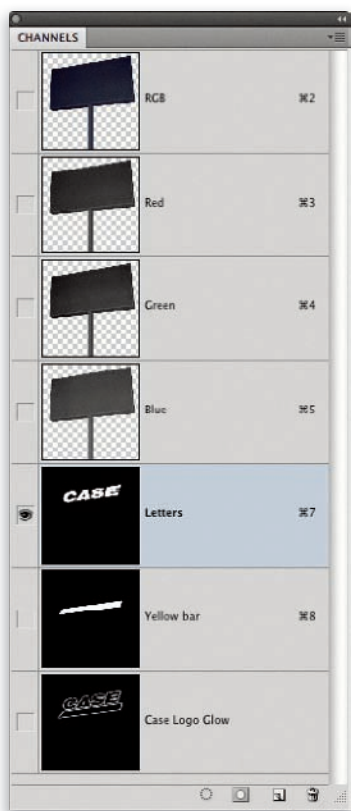
The window glass channel



Case logo in Illustrator



Photoshop's Paste options for paths



The three channels

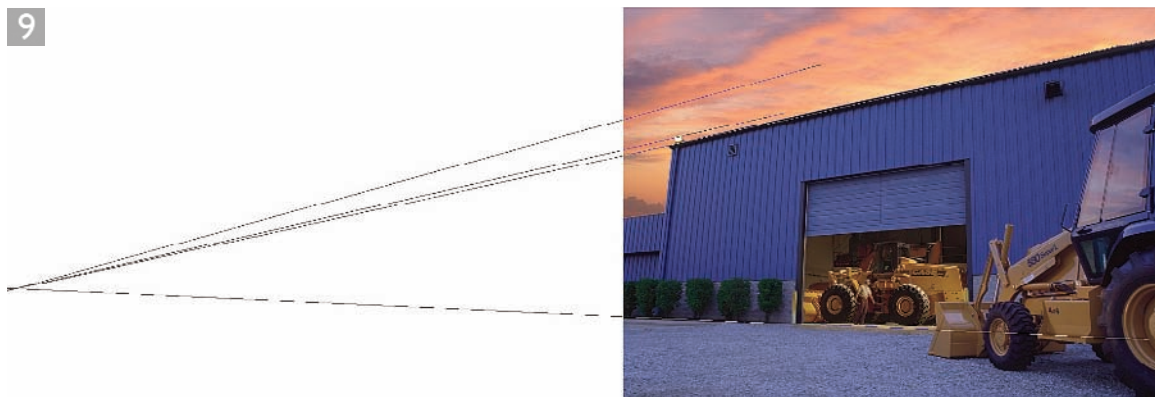


7 This is where it started to get complicated. The art director gave me an Illustrator file with the Case logo. In Illustrator, I selected the paths and copied them. Back in Photoshop I pasted as paths (see the Paste options). I transformed the paths to fit on the sign background I had previously made (based on a loose 'description' by the client). Then I loaded the paths as a selection and created a mask channel. Well, three channels to be precise: one for the text, one for the colored bar and a third that I blurred to create an outline glow to make the sign look like it was lit from behind. You'll note that I cut the Case logo into two separate channels because the logo had different fill colors.



8 This the final sign already outlined ready for compositing into the main image.

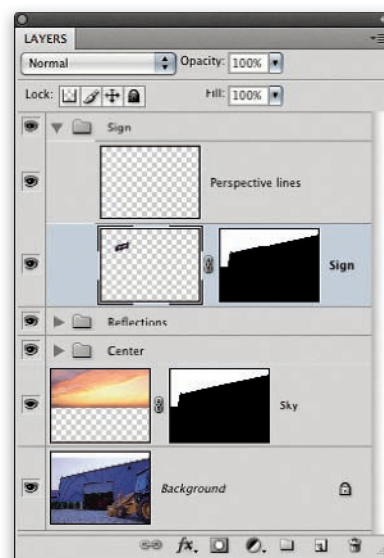
9



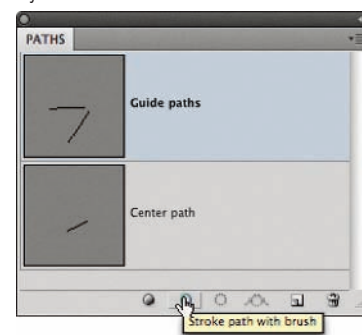
9 Before I could position and size the sign, I had to know what sort of perspective I would need. I accomplished that by creating two-point perspective lines using the building as a guide for the vanishing points. I created the perspective lines using the pen tool (which can go outside the boundaries of the canvas) while the image was zoomed way out. Theoretically, I could have done a vertical set of perspective lines as well. But I had built the original sign with a keystone built in and would make that final adjustment by eye.

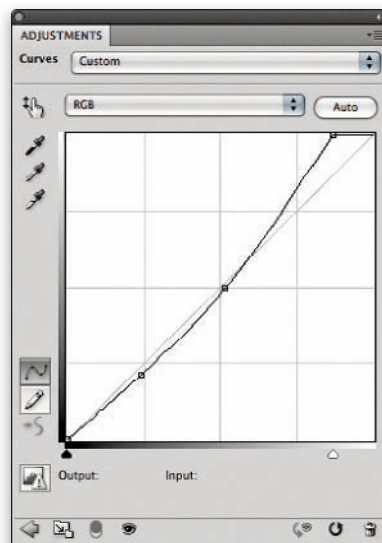
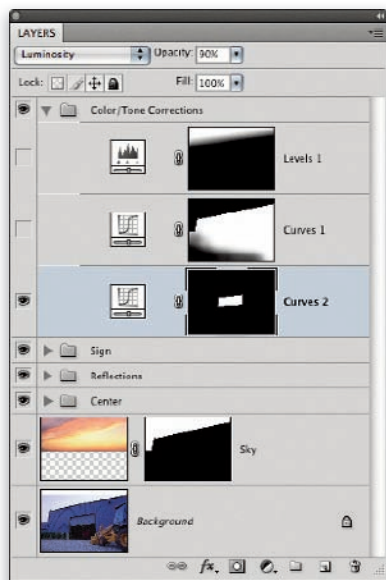


10 I used the Stroke path with brush to paint white lines on a separate layer to use as a guide for sizing and positioning. I then targeted the Sign layer and used Edit ⇨ Transform ⇨ Free Transform to size and position the sign.

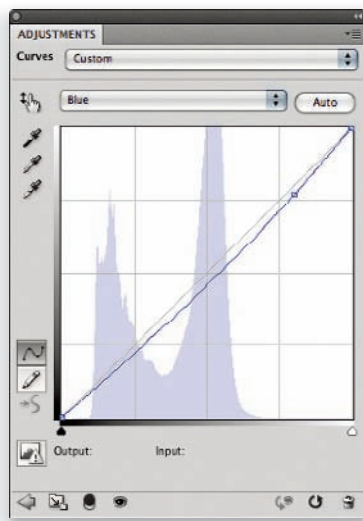
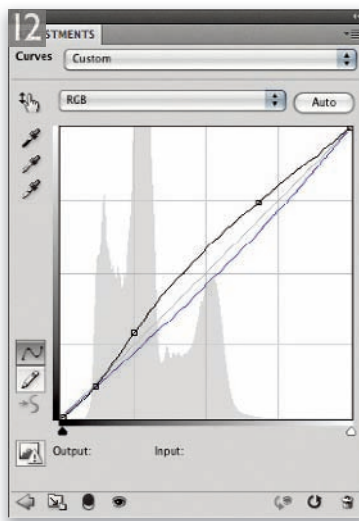
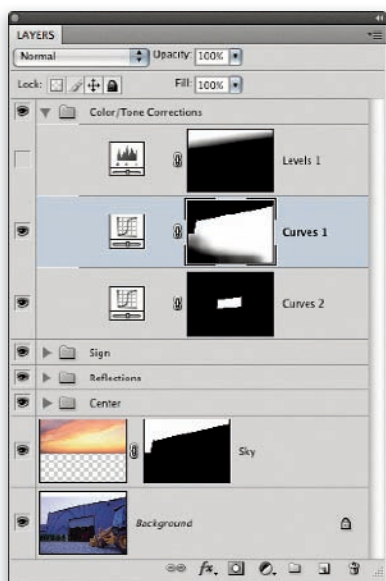


Sign layer targeted with the perspective lines layer also visible.



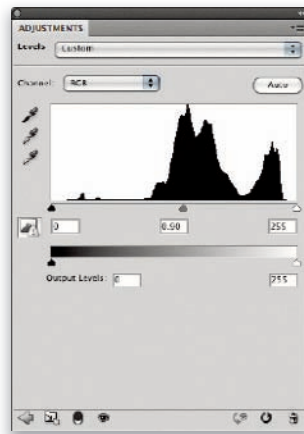


11 I needed three Adjustment layers to make final tone and color corrections to the composite. The first adjustment was to tone down the overhead door which appeared lighter than the side of the building. I used a Curves adjustment to darken just the door.



12 The second adjustment was to lighten the front of the building as well as the tractor. I used a layer mask to keep the adjustment off the sky and painted the area of the gravel out as well. In addition to the tone adjustment (above left) I also targeted the blue channel to reduce blue and warm up the color balance. Since the building was shot with basically a white sky, the building had looked too cool.

13

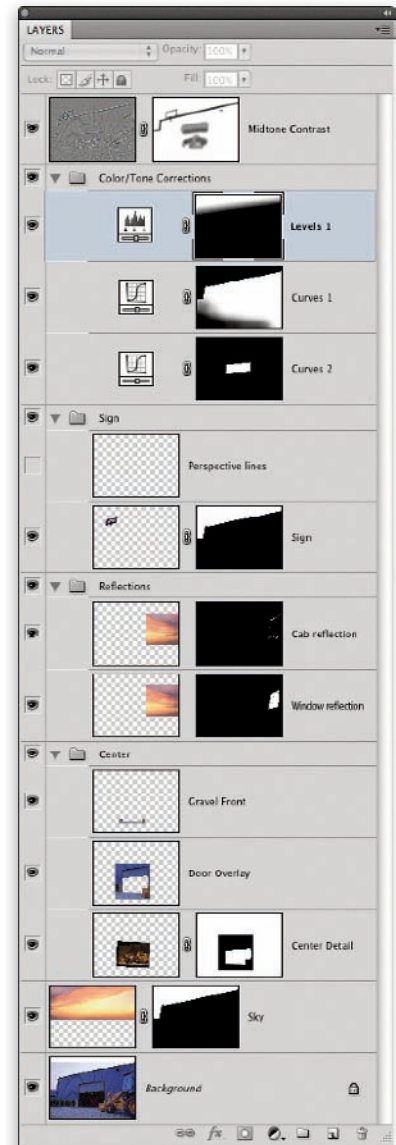


13 The last adjustment was to darken the sky using a gradient from the upper left. Very little of the sky needed to be darkened and I only darkened it slightly by shifting the Levels gamma slider to 0.9.

14



14 This was the final composite: eight pixel layers, three adjustment layers and a final overall midtone contrast boost. The final imaging took about three days' work including scanning the original film (35 mm), building the sign, searching for the stock sky and compositing the various layers. The art director was pleased (and a bit amazed). The only thing I haven't mentioned was the job was actually for two versions of the final image. You see, the job was to do the exact same image with the Case Construction (shown above) as well as the regular Case Tractors. That meant two signs, two exterior shots and two interior shots. Two times the work and two times the billing (even though it wasn't two times the hours since I could reuse pieces).



Third-party plug-ins

Most serious composite work is usually carried out against a plain backdrop. For example, the Ultimatte AdvantEdge software (www.ultimatte-software.com) requires that you shoot your subject against a blue or green backdrop. However, Vertus Fluid Mask (www.vertustech.com) is different in that it can do a very good job of cutting out images from busy background scenery.

Masking hair

If you are a people photographer and use Photoshop to create montage images, you will appreciate how difficult it is to successfully mask hair. There is always a lot of discussion on the various Internet forums about this particular subject, so I know it is something that will interest photographers and Photoshop artists. The problem most people have is how to get rid of the trace pixels around the edges of the hair, as these are always a sure giveaway that a picture has been composited badly. What follows on pages 210–216 is a hair masking technique that has served me well over the years, which you can apply using Photoshop without the need for any extra plug-ins.

The first thing I should point out here is that for this method to work, your model or subject must be photographed against a white or light colored backdrop. Now I know a lot of people come up to me at seminars and ask how they can adapt this technique to work with ordinary images shot against busy backgrounds. Well, it won't always work so well with such images and if this is your goal, then you'd be better off using the technique shown later on pages 217–220, or use a third-party plug-in such as Vertus Fluid Mask (see sidebar). The point here is that if you know you are about to create a cut-out composite image, then you must shoot your subject with this in mind. Some plug-ins, such as Ultimatte AdvantEdge, require that you shoot the subject that's to be cut out against a blue or green screen. Similarly, this Photoshop technique works best if you shoot against a white backdrop. As I say, it can work with backdrops that aren't pure white, but you'll just be making the task a lot harder for yourself.

How it works

This method revolves around making use of the existing color channel contents and copying the information which is already there in the image and modifying it to produce a new mask channel. So, instead of attempting to trace every single strand of hair on a mask with a fine-tipped brush tool, you can save yourself a lot of time if you make use of the information that's already contained in the color channels and use this to define the finely detailed edges. However, you may still find that the pen tool is useful for completing the outline around the smooth broad outline of the neck, shoulders and arms of the model's body. I've not shown how to do this here because I didn't want to make the

following steps too complicated. If you do need to use the pen tool you can do so to define the areas that need to be included in the mask, then convert the vector path to a selection and fill with black.

The main message I want to convey here is that it is always worth exploiting the channel content as much as you can as a shortcut for building an accurate mask that is based on the actual image. As I show in the following tutorial, the tools I find useful here are the Apply Image command for building the initial contrast by blending a channel with itself, or with a second channel. Another great tip is to change the paint brush blend mode to Overlay blend mode when editing a black and white mask channel. In recent years, I have even found that the Shadows/Highlights adjustment, and in particular the Brightness and Contrast sliders therein, can be used to further improve the mask contrast.

Getting the different elements to match

This should go without saying, but in order to create a successful composite, you do need to make sure that the photographs you are about to combine all match in terms of camera angle and height, the focal length of the lens and, above all, lighting. It doesn't matter how good you are at Photoshop, if you can't get these things right from the start, you'll never be able to produce a realistic-looking composite. The camera angle and focal length matter most when you are working with wide-angle shots. If you are combining photographs that have been shot with a longer focal length lens there is a much greater margin of error. The lighting doesn't always have to be exact, but if you wish to merge a photograph taken in the studio with an outdoor scene, you will probably need to use a lot of top light and possibly include a direct spot to simulate sunlight. See also the sidebar on the Matchlight software solution for helping photographers calculate the optimum lighting setup.

Keep the mask edges soft

Retouched photographs won't look right if they have 'pixel-sharp' edges. A mask that's derived from a vector path will always be too crisp, even if it is anti-aliased. To create a more natural-looking result you should always use soft-edged masks. This is where the Refine Mask dialog comes in handy because it allows you to use the Radius, Contrast and Feather sliders to control the softness/hardness of the mask edges.

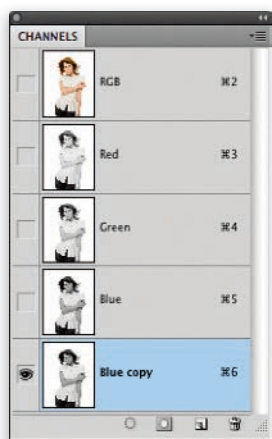
Matchlight software

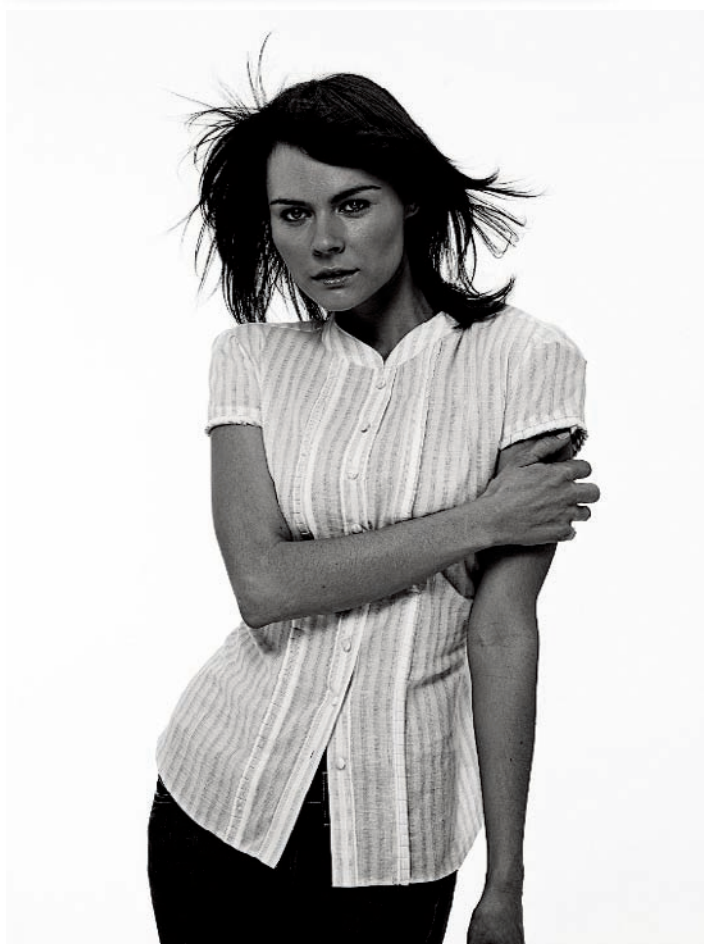
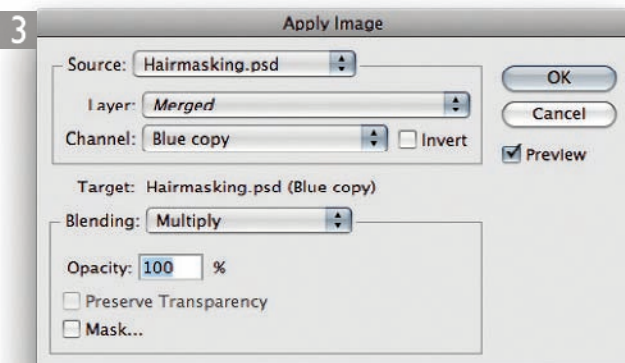
Professional studio photographers may be interested in looking at the Matchlight system, where you can place a special disk in a location scene and the software will be able to interpret the camera angle and lighting you need to use in the studio to match the outdoor location. For more information go to: www.gomatchlight.com/products.html

1 The following steps describe how I would go about photographing a model with a view to adding a new backdrop later. I normally plan my shoots so that I always photograph the subject that is to be cut out against a white background, as this is the best way to mask the fine hair detail. In this example the background was not completely white, but there was certainly enough contrast between the hair and the backdrop for me to use the following technique to create a cut-out of the model and place her against a new backdrop image.

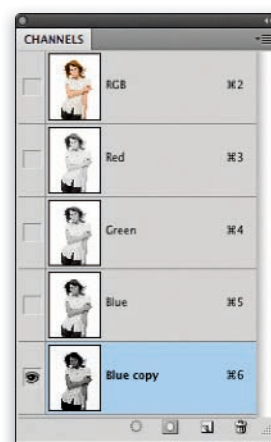


2 I began by looking at the individual color channels and duplicated the one that contained the most contrast; in this case I decided that the blue channel had the most contrast between the hair and the background. I duplicated the blue channel by dragging it to the New Channel button in the Channels panel. This created the new Blue copy channel, which is the one shown active here.





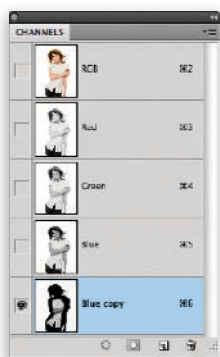
3 To increase the contrast in the Blue copy channel I went to the Image menu and chose Apply Image... Here, I let the Blue copy channel blend with itself using the Multiply blend mode, which effectively darkened the channel. You could just as easily use a curves adjustment at this stage instead, but the main reason why I prefer to use Apply Image here is because you can sometimes choose to blend other color channels with the copy channel. For example, you might like to try blending the Green channel with a Blue copy channel. As well as using Multiply, you might like to experiment with using the Overlay blend mode here.



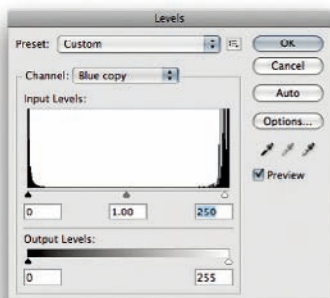
Black & White adjustments tip

I recently picked up a great tip from Photoshop engineer Gregg Wilensky, who suggests making a duplicate copy of a layer and applying the Black & White adjustment to increase and/or decrease the tone contrast where required in order to prepare a mask based on the color image content. Once you have done this you can copy the layer contents and paste this into a new channel.

4 I now wanted to increase the contrast to create a silhouette mask. To do this I used the brush tool set to Overlay mode and toggled between using black and white as the foreground color. When using the Overlay blend mode, as you paint with white, paint is only applied to the light colored pixels and as you paint with black, paint is only applied to the dark colored pixels.



5 The Overlay blend mode is therefore useful when painting on a mask because you can paint quite freely using a large pixel brush to gradually build up mask density around the outline of the subject, but without accidentally painting over the light areas. I continued to paint, taking care not to build up too much density on the outer hair strands (one can switch to Normal blend mode to finish the mask). I also prefer to paint using a pressure-sensitive Wacom™ pen and tablet, with the pen pressure sensitivity for Opacity switched on in the Brush panel Transfer options. Finally, I applied a direct Levels adjustment to boost the contrast slightly.



4



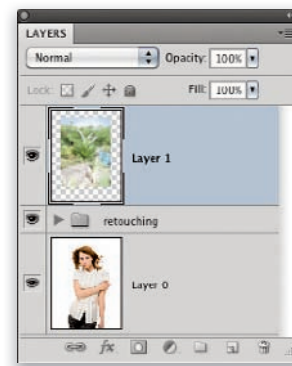
5



6



6 It was now time to add a backdrop photo. I opened up a new photograph of an outdoor scene, selected the move tool and dragged the backdrop image across to the model image window. This added the outdoor image as a new layer. I kept Layer 1 active, chose Edit ⇨ Free Transform and dragged the handles to scale the new layer so that it filled the bounds of the underlying layer. When I was happy with the scale transform I clicked OK.



7

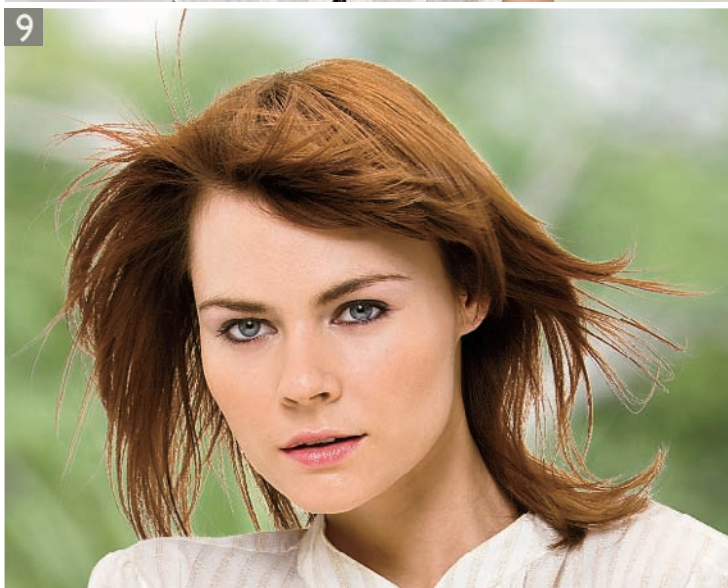


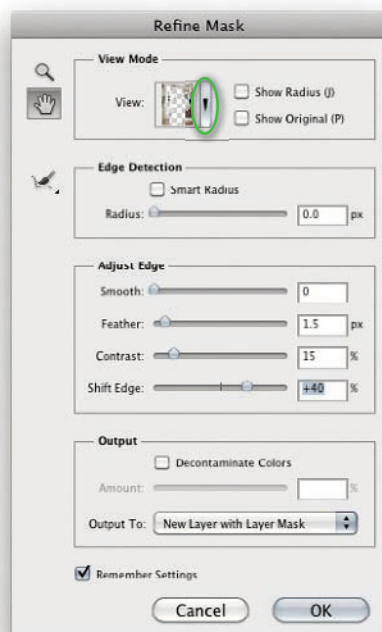
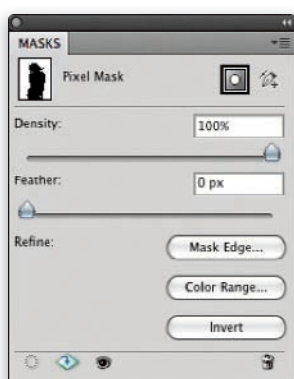
7 I dragged the Blue copy channel to the Load Selection button in the Channels panel and then clicked on the Add layer mask button (circled) in the Layers panel to convert the active selection to a pixel layer mask.

8 This last step applied a layer mask to the salon backdrop layer, which basically punched a hole through Layer 1 and allowed the photograph of the model to show through from below.



9 For this next step I set the layer blend mode to Multiply, which effectively 'projected' Layer 1 on top of the Background layer. As you can see, it is not a bad mask, but there are still some areas where we have white edges showing around the outline of the hair. The initial layer mask had worked reasonably well, but could still benefit from some fine-tuning.





10 Next, I made sure that the layer mask (not the layer image thumbnail) was selected and clicked on the Mask Edge... button in the Masks panel, to open the Refine Mask dialog shown here, where I selected the On Layers view in order to show the transparency of the mask. Here, I began by setting the Shift Edge slider to +40%, which effectively choked the mask. I know this sounds back to front, but remember that the mask that's used here was hiding the selected layer and I therefore needed to 'expand' the mask in order to shrink the size of the hole. Basically, you simply drag the Shift Edge slider left or right to see which setting works best. In this instance, using CS5, I didn't want to adjust the Radius option, but I did adjust the Feather slider to help keep the mask edge looking soft and raised the Contrast of the edge slightly to +15.

At this stage you can see how the edges of the mask looked more convincing and I was now getting a more convincing blend for the loose strands of hair against the outdoor image.

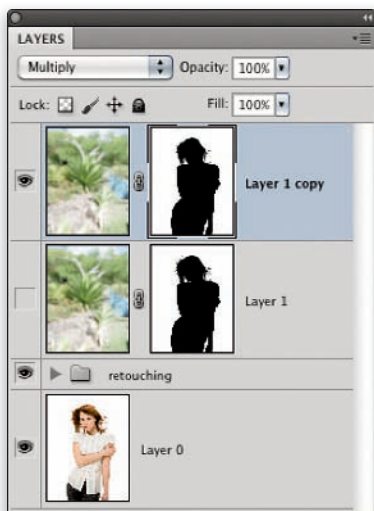
Refine Edge/Refine Mask/Mask Edge...

At this stage you might find all the above terms rather confusing. Essentially they all mean the same thing. Whenever you have a selection active the Select menu says 'Refine Edge...' and this allows you to use the dialog shown here to refine a selection prior to doing anything with it. This isn't particularly useful, since most of the time you want to adjust the controls with the selection already converted to and applied as a mask so that you can visualize the effect the controls have with the layer mask in place. When you have an active layer mask selected the Select menu says 'Refine Mask...'. The Mask Edge... item in the Masks panel opens the 'Refine Mask...' dialog and should really be labeled as such.

11 Here is the completed image in which you can see a full-length view of the model against the new image backdrop, and with just a few further modifications made to the picture. For example, I carried out some basic beauty retouching on the face and added a lightening curves adjustment that was clipped to the background.

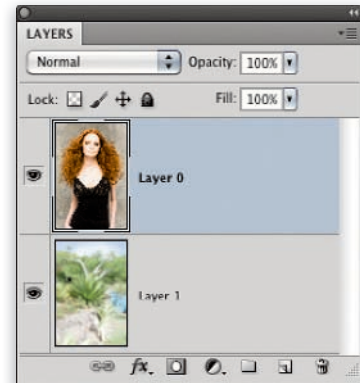
In the photograph you see here, I used one pass of the Refine Mask to achieve the best modification of the mask. Overall, I reckon the mask looked pretty good, but there were a few areas along the lower half of the model's left arm where I would probably want to improve the mask.

If I wanted to be really precise here I could refine the mask edges with two applications of Refine Mask. To do this, I would go to the History panel and create a Snapshot of the current Refine Mask state. I would then undo the last Refine Mask step and reapply Refine Mask, but this time adjust the settings for say, the edges of the arm, then take another snapshot. Having done that, I would select the history brush and sample from either of the two snapshot history states to paint along the edge of the subject. As I say, it shouldn't always be necessary to go to such lengths, but it is possible to blend two different Refine Mask treatments should you need to.

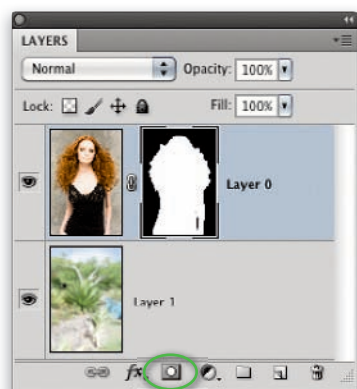


Hair masking using Refine Mask

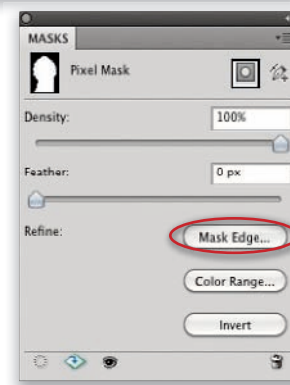
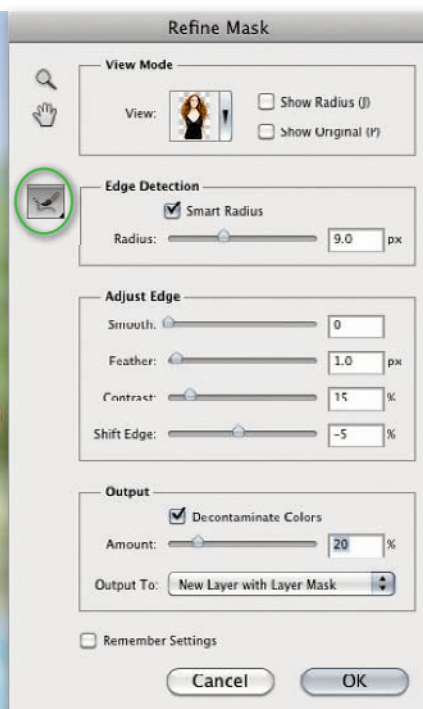
Photoshop CS5 now allows you to make use of the Refine Mask command to mask complex objects, such as hair, more easily.






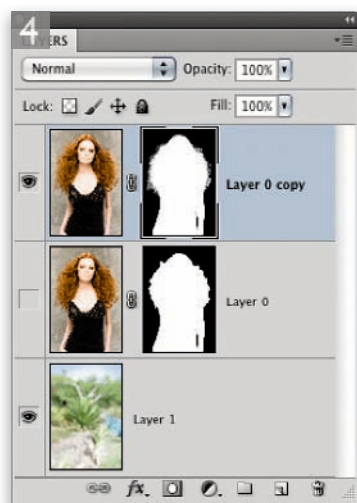
1 To start with I placed the same backdrop layer, as was used in the previous step examples, directly below the layer shown here of a model photographed against a painted backdrop. The aim here was to show how it is possible to use a combination of a quick selection combined with the Refine Mask to successfully isolate the hair outline. So the first step here was to select the quick selection tool and drag to make the selection shown active here.



2 I then went to the Layers panel and clicked on the Add layer mask button (circled) to convert the selection into a layer mask that masked the outline of the model against the backdrop image on the layer below. As you can see here, this selection-based mask is OK around the outline of the model's body, but the hair outline so far has a blunt edge.



3 To improve the hair masking I opened the Refine Mask dialog. There are several ways I could do this. I could go to the Select menu and choose Refine Mask..., I could click on the Mask Edge... Masks panel (circled in red), or use the    **ctrl alt R** shortcut. The first thing I did here was to select the refine edge tool (circled in green) and painted around the outer edges of the hair outline. This made the biggest difference in improving the effectiveness of the hair mask. I then used the remaining slider controls to fine-tune the mask. I enabled the Smart Radius option and set the Radius to 9 pixels. I applied a Feather amount of 1 pixel and raised the Contrast to +15. I tightened the mask slightly by setting the Shift Edge slider to -5% and lastly, I checked the Decontaminate Colors option and set the amount here to 20%. Once I was happy with the settings applied here I clicked OK to apply the Refine Mask edit.



Client: Mack Hairdressing
Model: Ruth Bright

4 If you look in the Refine Mask options in Step 3, you will notice that the Output section in the Output To menu was set to generate a New Layer with Layer Mask. The thing to bear in mind here is that Refine Mask editing is a one-way process that changes the layer mask permanently. For this reason it is a good idea to have the Refine Mask edit process generate a duplicate layer with the revised layer mask made active.

Refine Mask controls

The controls in Refine Mask dialog include everything you need to modify a layer mask edge. You can open the Refine Mask dialog any time a layer mask is selected by going to the Select menu and choosing Refine Mask..., clicking on the Mask Edge... button in the Masks panel (Figure 7.2), or using the **⌘-⌥-R** (**ctrl+alt+R**) shortcut. The initial default preview may confuse you because it uses the On White view mode. Why this should be the default I don't know, but if you click on the button that's circled in Figure 7.3, this reveals all the View mode options. Here, I suggest you select the On Layers mode (**L**), then check the Remember Settings box at the bottom and click OK to save this as the new default.

The Refine Mask/Refine Edge dialog has been updated in CS5. The main thing to point out is that the Smart Radius option can be used to auto-calculate the optimum radius based on an analysis of the edge width detail in an image. Where there are narrow areas of contrast (such as along the arms of the model in the previous example), it applies a narrow radius. Where there are soft edges (such as a hair outline), the Smart Radius applies a wider radius. There is a PDF on the DVD that explains this and the other new Refine Mask features. These are also summarized over the next few pages, where I show how a mask was applied to the image shown in Figure 7.4 and edited using Refine Mask.



Figure 7.4 This shows the image used in the following Refine Mask steps.

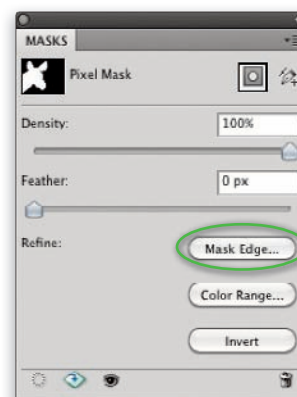


Figure 7.2 This shows the Masks panel with the Mask Edge... button highlighted.

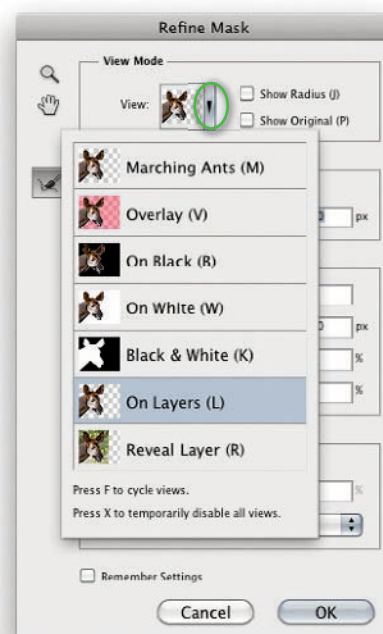
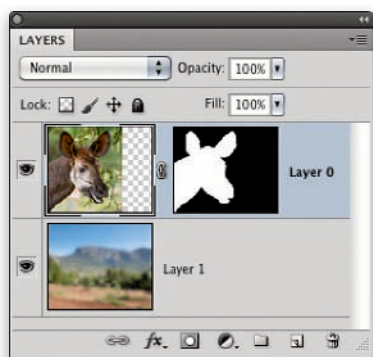
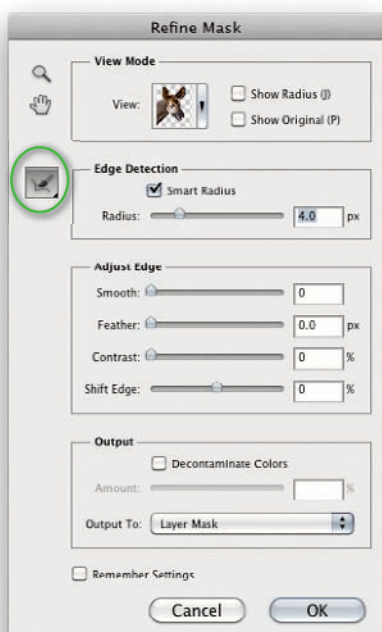


Figure 7.3 The Refine Mask dialog showing the different view mode options.



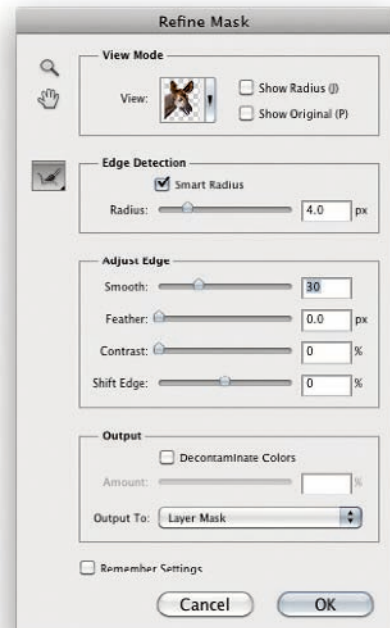
1 Here you can see the photograph shown in Figure 7.4 with a layer mask applied that was based on a simple quick selection. The steps used to create this were the same as those shown on pages 217–218.



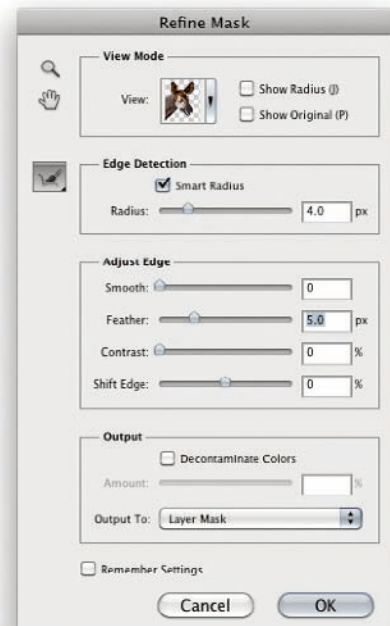
2 The first thing I did was to use the **⌘+R** **ctrl+alt+R** shortcut to open the Refine Mask dialog. I then selected the refine edge tool (circled) and used this tool to paint around the ears and the chin to add the fine hairs to the mask edge. I then checked the Smart Radius option and set the Radius to 4 pixels. I had to be careful not to set the radius too high, otherwise too much of the background in the original photo would show through.

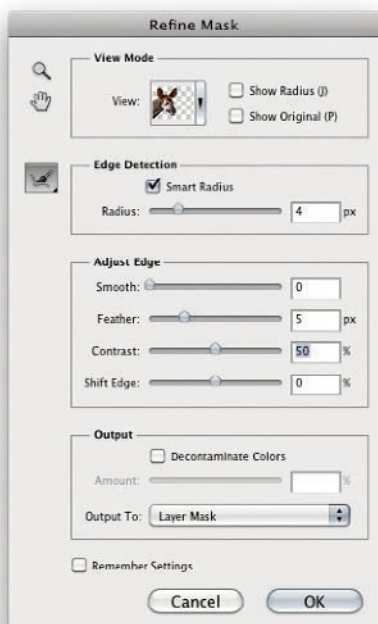


3 The Smooth slider can be used to help smooth out jagged selection edges. Normally you don't want to set the Smooth setting too high, but if you do so for whatever reason, increasing the Radius can help restore some of the edge detail. In this example I raised the Smooth value to 30 in order to exaggerate the effect.

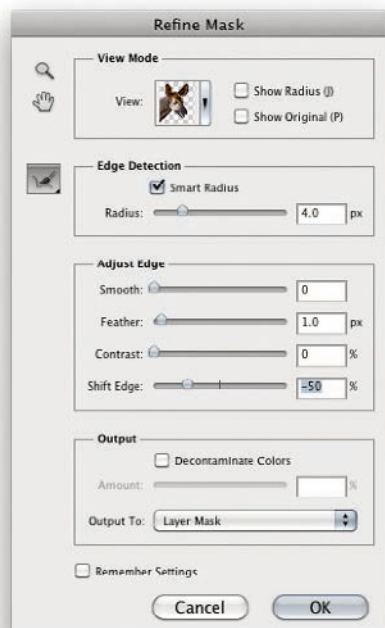


4 Increasing the Feather amount uniformly softens the edges and can help produce a softer edged mask. You can sometimes use the Feather slider in conjunction with the Contrast slider to fine-tune the mask edge appearance.





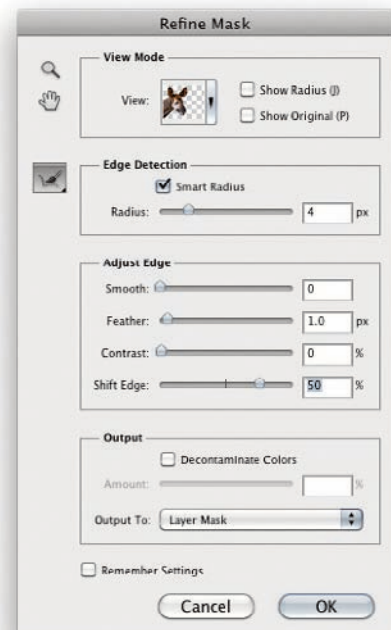
5 The Contrast slider can be used to make soft mask edges crisper as well as help remove artifacts along the edges of a selection. In this example, I applied a 50% Contrast adjustment in order to harden the feathered edge that was created in Step 4.



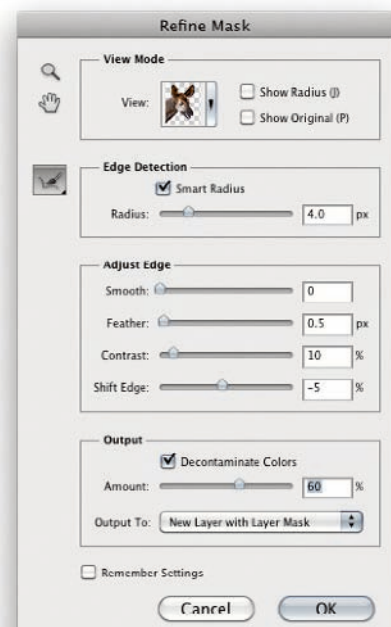
6 For this step I set the Feather to 1 pixel and reset the Contrast slider to zero. The Shift Edge slider acts like a choke control for the mask and shrinks or expands the mask. In the example shown here, I set the Shift Edge slider to -50% so that it masked the layer more tightly.



7 In this next example I set the Shift Edge slider to +50% so that it expanded the mask and didn't mask the edges quite so tightly. Very often you will find it useful to adjust the Shift Edge slider first, before you adjust the other sliders.

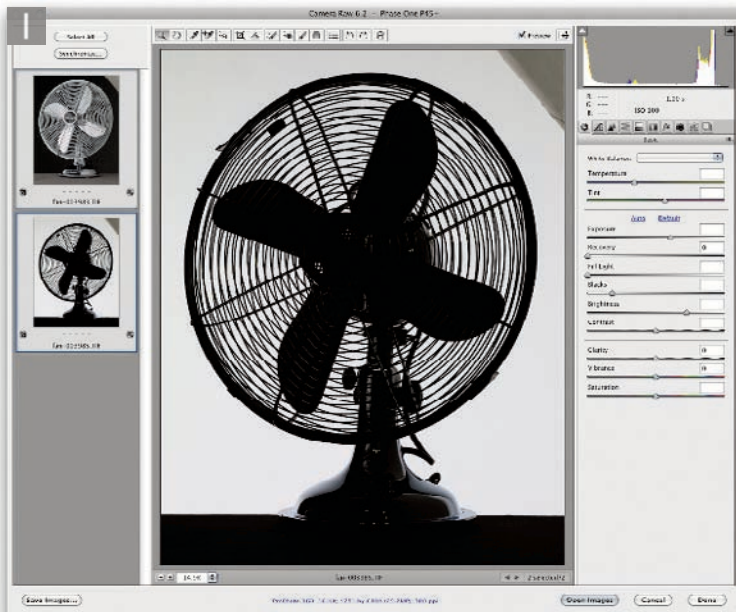


8 For this final step I adjusted all the sliders to achieve an optimum mask edge. I set the Feather slider to 0.5 pixels, the Contrast to 10% and the Shift Edge to -5%. Lastly, I checked the Decontaminate Colors option and set the Amount to 60%. This slider can be used to remove fringe traces of color in the original image background so that the image blends better with the colors in the image layer below.



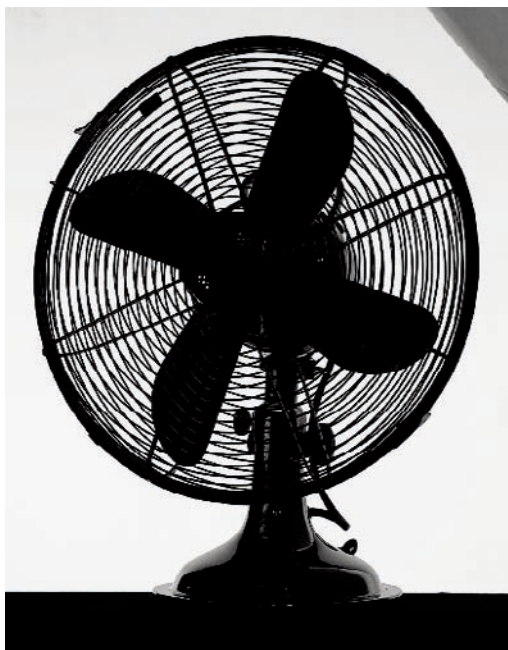
Cheating a mask

Do you really need to spend ages creating a mask in Photoshop? If you are a still-life studio photographer, the answer may be staring you in the face. I wanted to give you here one example of a situation where a table-top studio setup can allow you to cheat at creating a mask by simply turning off the foreground lights, making an additional exposure with a digital camera and using the silhouette image this creates as the basis for a mask. As long as you are using a digital camera to capture the two exposures and the camera is mounted on a tripod, the mask created here will be completely pixel accurate. And believe me, as much as I am a fan of the pen tool, the thought of using it to outline something like this would keep me awake at night.

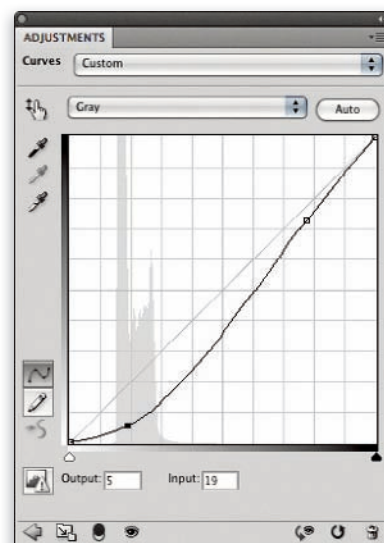


1 This shows the raw files of the fan opened in Camera Raw. In order to maintain the exact pixel for pixel relationship of these two shots, it was super-critical to make sure the crop for all the processed images was exactly the same. In this step I've got both images selected and clicked on the Synchronize button. In the resulting dialog, I selected the Crop option only to synchronize with and then clicked OK.

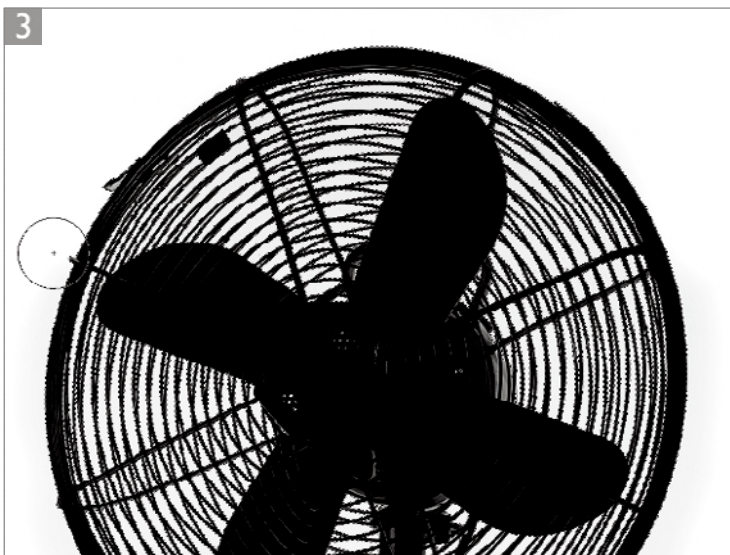
2



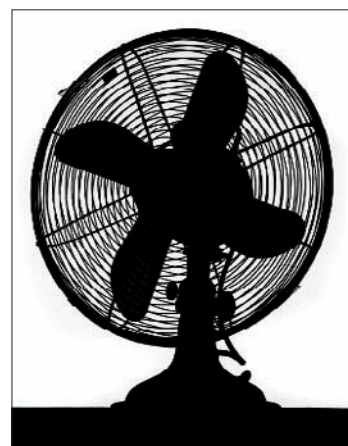
2 Here you can see the image with the front light off and the back light on opened and converted to grayscale. Since I was only working with this image in order to create a channel, there was no reason for me to work in color here. I did need to do a Curves adjustment to lighten up the background but without lightening the shadows too much.



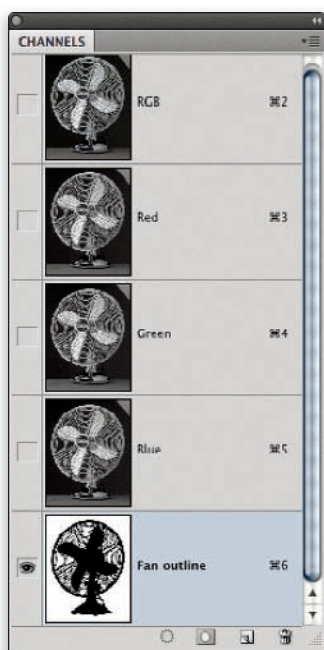
3



3 I then zoomed in a bit and loaded the grayscale channel of the image itself as a selection, then painted around the fan to improve on the mask and eliminate as much tone as possible in the white areas. You'll note that prior to loading the selection I had already painted out the upper right corner that had the fill reflector card showing. Since that was a broad area far enough from the fan itself, I didn't need to worry about working with a selection. You'll also note that inside the fan's circular cage, the base still had some tones that would need to be knocked out. Rather than trying to paint these out by hand, I needed to fix that in the next step.



4 In order to accurately fix the base, I created a path that followed the contour of the base exactly. That path was turned into a channel (above left) and the original channel loaded as a selection. I then loaded the Base Outline channel, inverted it and set it to Intersect with Selection. This bit of 'Channel Chops' work resulted in the figure on the upper right. I also used the Base outline to clear the horizon line and outline the fan base. The next step shows how I copied the edited channel into the main RGB image of the fan.



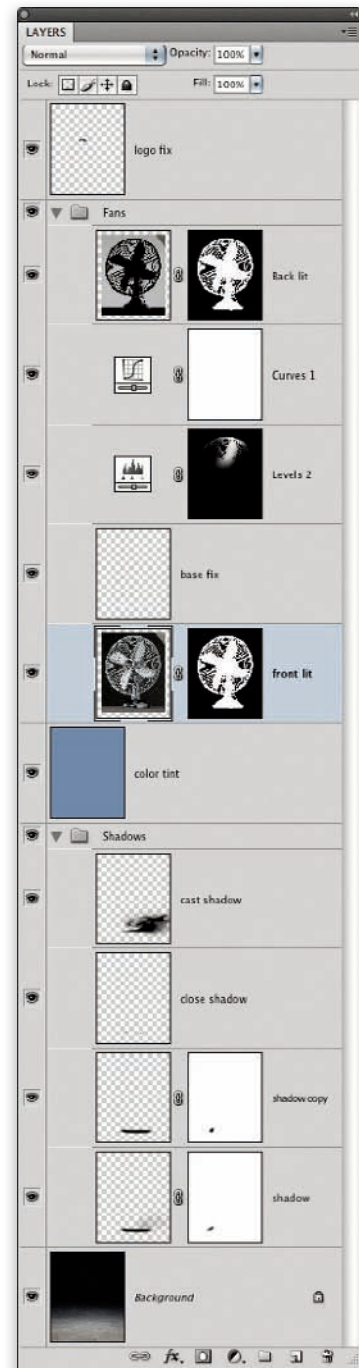
5 Using the move tool, I dragged and dropped from the grayscale image (on the right) to the RGB image (on the left). It was important to hold down the **Shift** key once I had started the drag. Adding the **Shift** key while dragging instructs Photoshop to do a pin registered drop so the pixels will line up exactly. The Channels panel on the far left shows how the Fan outline channel had been added to the color image in registered position. Before using it as a layer mask, it was necessary to invert the channel mask using the **Ctrl+I** keyboard shortcut.



6 In this step I zoomed in (after inverting the channel) to work on some of the residual areas that needed fixing. This often happens with 'shiny things' that catch a bit of reflection, but it still beats using the pen tool!



7 For this final composite, you can see the main fan layer used the fan outline as a layer mask (after the base had been added to the channel). I also added a second fan layer in the composite – the original back-lit image (in color) that I made the mask from. This second fan image added a bit of tonality at the very base of the fan. The rest of the layers included image adjustments, shadows and a color tint layer to colorize the background.



Masking an object with a path

Martin and I both wish there was some sort of magic tool that could be used to make beautiful masks at the snap of a finger, but we've tried them all and when something must be very accurate we usually fall back on the pen tool to create a path. Because the pen tool has sub-pixel accuracy, no pixel-based selection can ever be as accurate. So, we both are very good at making paths in Photoshop. It's kind of the mark of a true craftsman if you are good at this, and pretty much guarantees a mask will end up 'perfect'.

The following combination was a job I wished I didn't have to do as a composite with a studio shot – February in Chicago would be a real nice time to go down and do a shoot on a cruise ship. Alas, there wasn't enough budget to do that, so I did research on exactly what the shot would look like if done for real, and Figure 7.5 is what I came up with.

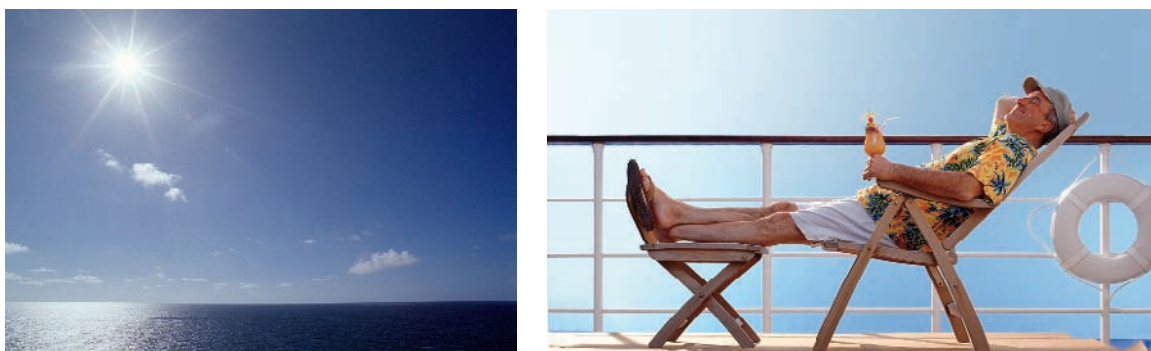


Figure 7.5 The sky image was a personal stock image (which I charged stock rates for the client to use) and the image on the right was shot in the studio (in February) and lit to make it appear to be outside. I did try real hard to make a blue-screen attempt at knocking out the blue background but it didn't work.

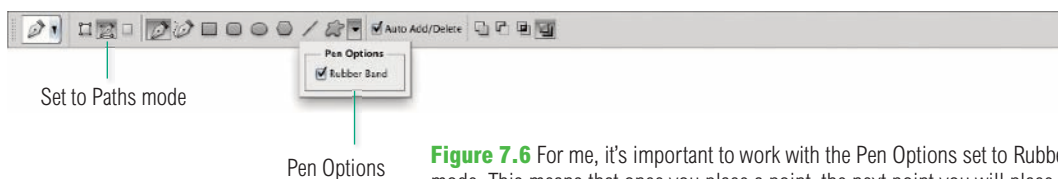
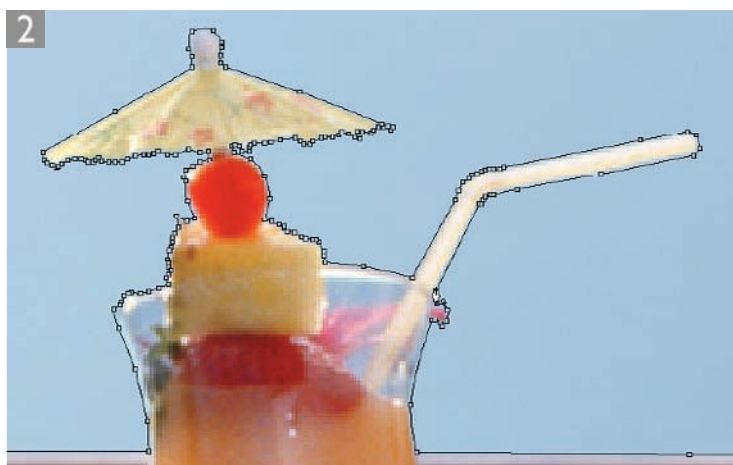


Figure 7.6 For me, it's important to work with the Pen Options set to Rubber Band mode. This means that once you place a point, the next point you will place will have a line behind the cursor that shows you where the path will be drawn, before it's actually drawn by placing the next point. This gives you the ability to predict what the resulting path will look like before dropping that next point. The other thing you need to be sure of is that the pen tool is in Paths mode. This will result in a path being drawn instead of a Shapes layer.



1 The first step was to create a new path and then zoom way in. I prefer to draw paths when zoomed in to at least 200% to get a very accurate view of where the path will end up. I was also able to decide what would end up in or out of the final outline. Here, I started at the drink in the man's hand and began placing points. The cross-hair shows where the point will be placed and the line behind is the Rubber Band option showing where the path will be placed once I clicked (see Figure 7.6).



2 Fast forward to the end and I was ready to make the last point and complete the path. While completed, the path may still need some fine-tuning in some places. Figure 7.7 shows zooming in and adjusting the path. The pen tool offers extremely accurate placement of what will eventually become a channel and then be converted to a selection for use as a layer mask. Those steps come next, including the use of the Focus path shown in Figure 7.8.

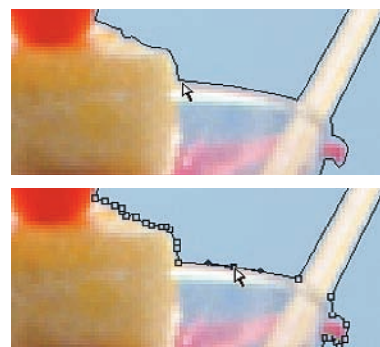


Figure 7.7 Using the direct select tool (shown top) I clicked on the path. Note that you can use the keyboard shortcut of **⌘** with the pen tool selected to get the direct select tool. I then clicked on the path (bottom) where I could move the point ever so slightly to improve the outline of the final path. It is also worth noting here that you can nudge the selected anchor point using the arrow keys.

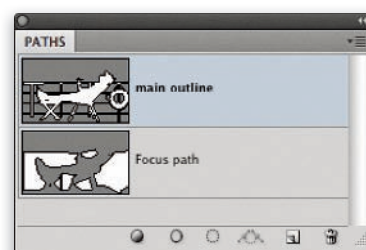
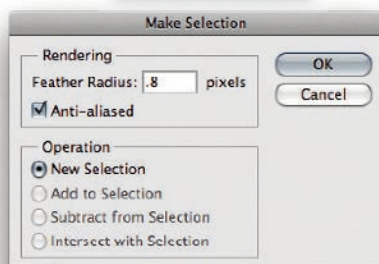
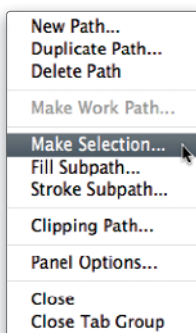
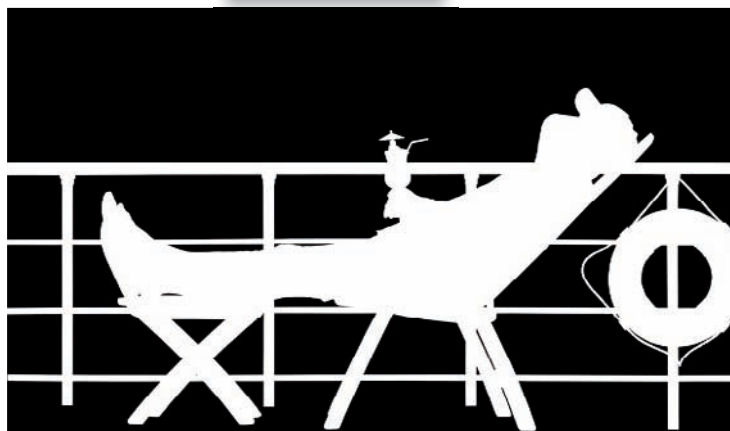


Figure 7.8 These are the two paths created. The main outline path was for creating an eventual layer mask and the Focus path was created to modify the final outline mask to add an apparent falloff in the depth of field to the Guy in Chair layer mask shown in Step 4.

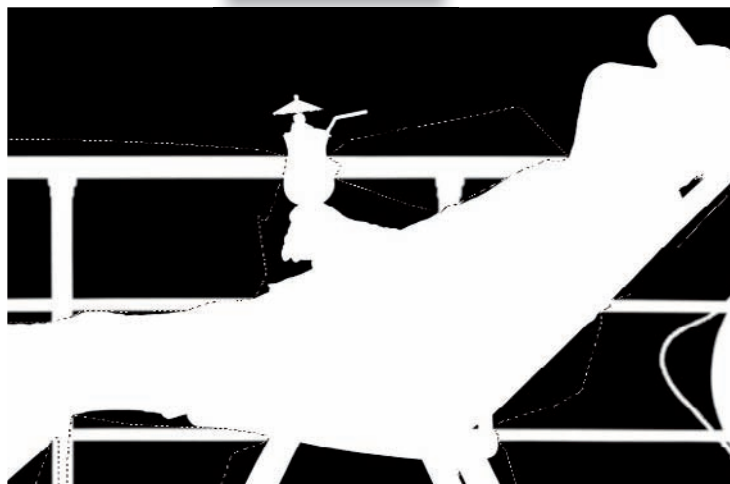
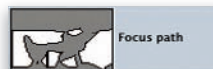


3



3 Here, I activated the main outline path (above left) and in the Paths panel flyout menu chose 'Make Selection...'. In the Make Selection dialog I used a 0.8 radius for the Feather Radius. I've learned that while you can always soften up a channel, it's very difficult to accurately harden the feather. So, I always tend towards a sharper feather and adjust it afterwards as I did in the next step.

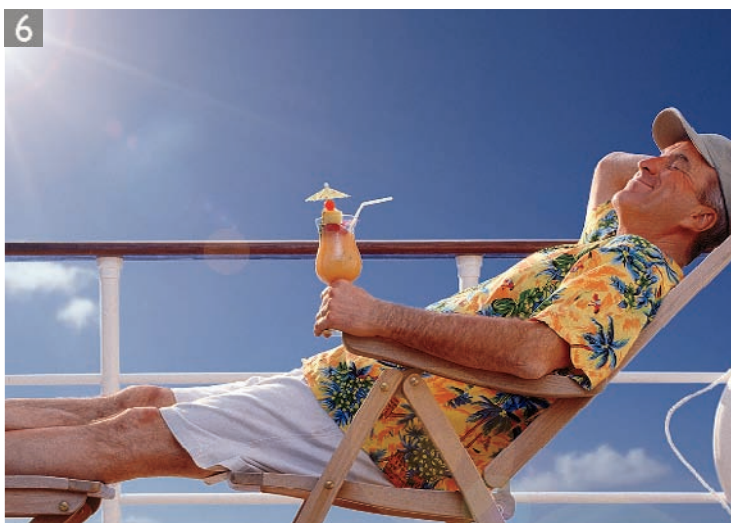
4



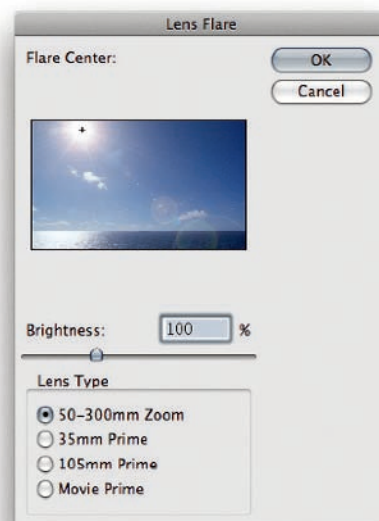
4 After doing the main outline path, I created a new path that would give me areas where I could apply additional blurring. This was needed to give the feeling of depth of field falloff. I turned the Focus path – which included all of the areas behind the guy in the chair – into a selection and used a 2 pixel radius Gaussian Blur to slightly soften the channel.



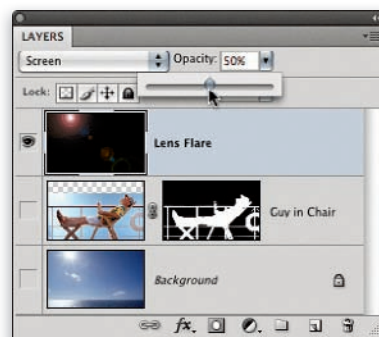
5 After turning the final channel into a selection and making the selection into a layer mask, I dragged the Guy in Chair layer onto the sky *Background* layer and positioned and resized it to fit.



6 While the composite in Step 5 was close to being complete, it needed something atmospheric to help integrate the foreground and background. Since there was already a bit of lens flare I decided to do more. I created a new layer filled with black and set to a Screen blend mode. I wanted to put the lens flare on its own layer and using the Screen blend mode meant that it would lighten the composite only in those areas that were lighter than black. However, the Lens Flare filter has a problem when previewing a black layer – you can't see the layers underneath. So I use a trick. I apply the filter first on a layer where the preview will be able to guide me, apply it, then immediately undo it. Then I retarget the layer in which I want to apply it and use **⌘ F** **ctrl F** to reapply the last used filter. There you have it, lens flare on a black layer (which is set here to 50% Opacity).



Lens Flare applied to background layer



Lens Flare reapplied to the black layer

Smart Objects

Smart Objects can be made from pixels (as this example will demonstrate), vector art or even a Camera Raw image opened as a Smart Object. Any 'object' that needs the ability to adjust size and rotation without the normal limitations of layered images is an excellent candidate for Smart Objects.

Working with Smart Objects

It should be noted that some of my best friends are art directors, so don't take it as a slam that I mention one of the more frustrating aspects of dealing with them is they have this annoying habit of changing their minds. For digital imaging, that can cause real problems. When doing a traditional multi-layer composite, the resizing and rotation of a layer can cause image degradation. Positioning and sizing an object has to be a precise operation because if you use Free Transform to make a layer smaller and then find out you actually need it back at the original size (or bigger) you basically have to start over. The way to deal with this situation when doing a complex composite is to make those layers into Smart Objects. Smart Objects are embedded image objects that allow resizing, rotation and other select editing without actually changing the pixels in the object. The image layers are actually treated as a separate file embedded within the master file. You can't do all editing on the Smart Object, but you can open the original layers as a temporary file and do pixel-level editing there, then save the changes back into the Smart Object. The changes auto-update in the image in which the objects are embedded. It's easier to show than explain, so let's see an example of what I mean. In Figure 7.9 you can see a series of shots of electronic widgets (I really don't know what they are, I just shot them) that were outlined and put on a colored, textured background.

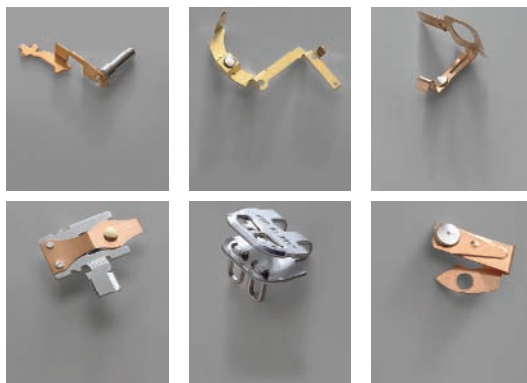
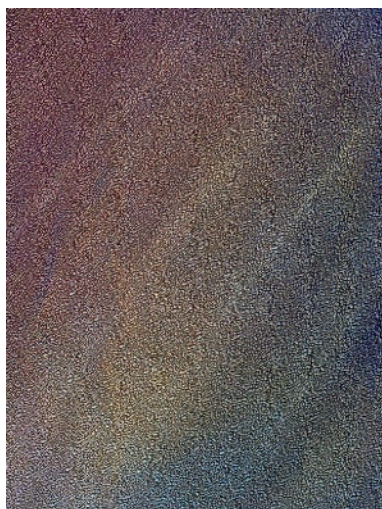
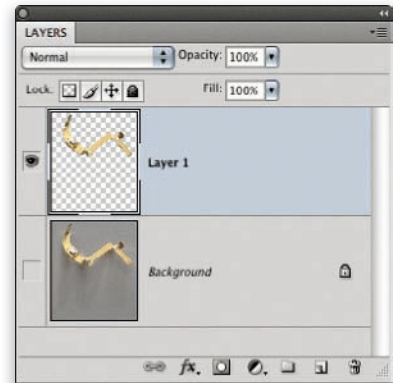
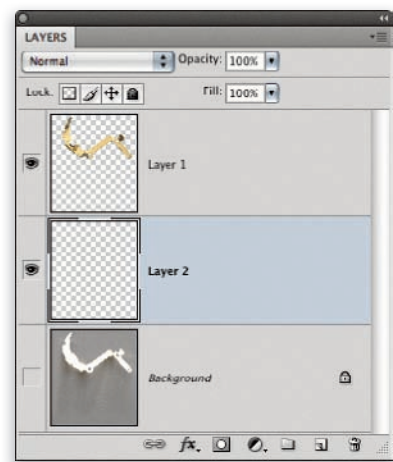
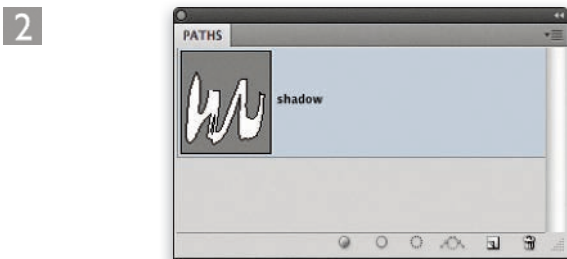


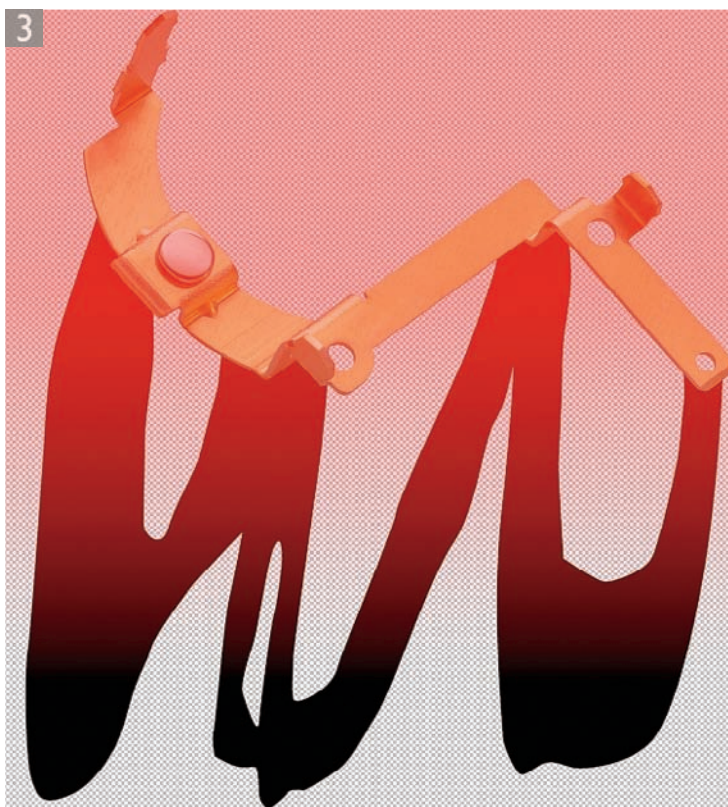
Figure 7.9 The original shots were done on 4 x 5 color film and scanned. Care was taken to finesse the lighting individually – hence the reason for shooting them separately. The background image was of a plaster cast of texture airbrushed to achieve the color and with cast shadows and light highlights.



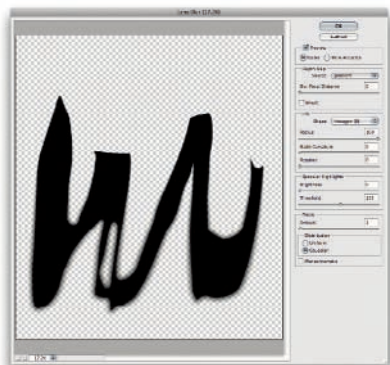
1 The first step in this process was to prep the image for both outlining and adding cast shadows. The image above had been retouched at least as far as spotting and cloning was concerned. The overall color (of the object) was good. You'll note that the crop was wide enough to provide a hint of a natural shadow. This was important as the real shadow would be the basis of the made shadow. I used a path to create an outline and turned the path into a selection and used **⌘ J** **ctrl J** to make it into a new layer.



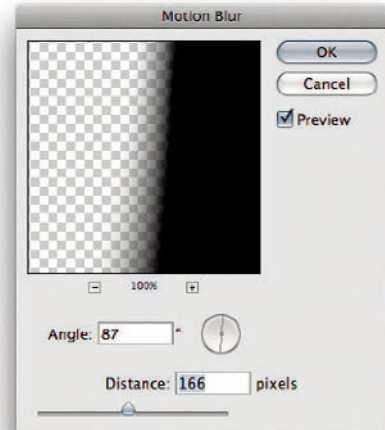
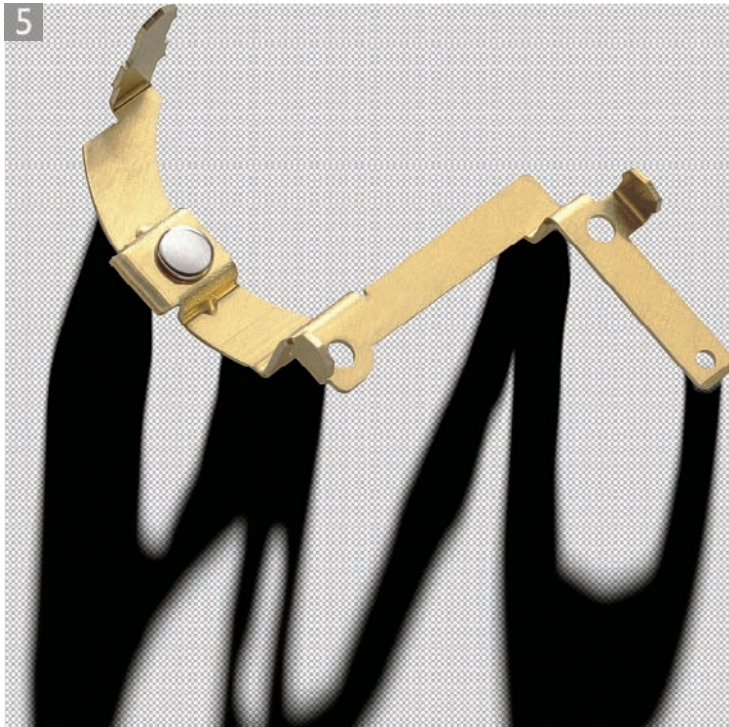
2 The next step, after using the pen tool to create a path of the natural shadows, was to turn the path into a selection. After making the selection, I added a new layer under the object as shown in the Layers panel on the right.



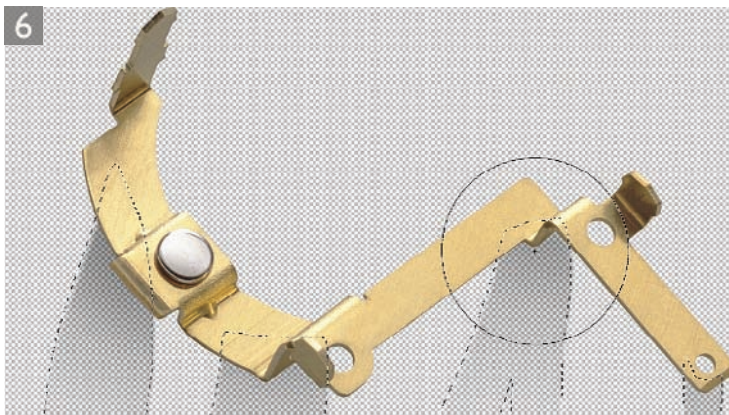
3 I wanted the Lens Blur for the initial blur to be gradated. After filling the selection with black, I added a gradient in Quick Mask to add a mask for blurring. This Quick Mask was then turned into a selection and saved as a new channel.



4 The main thing I did then was to apply the Lens Blur filter to the shadow alpha channel and run the Radius all the way up to 100. Meanwhile, I selected the above gradient as the Depth Map. This allowed the filter to be applied in a way to help simulate a more natural blur to the cast shadow, using the gradient to map the falloff of the blur.

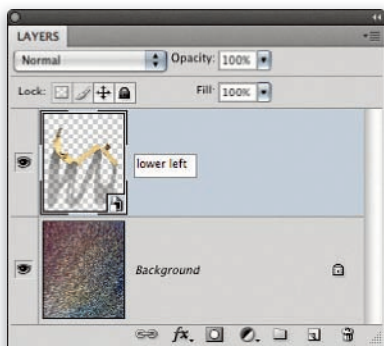
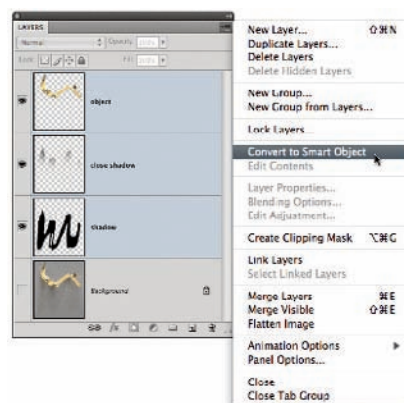


5 The falloff of the gradation needed an additional tweak. For this I used Motion Blur filter to make sure the slightly less than perfect drawn path's shadows were softened even more. The angle was selected to mimic the natural lighting direction and the Distance amount adjusted to provide a directional blur. After applying the blur, I reduced the opacity to 50%.

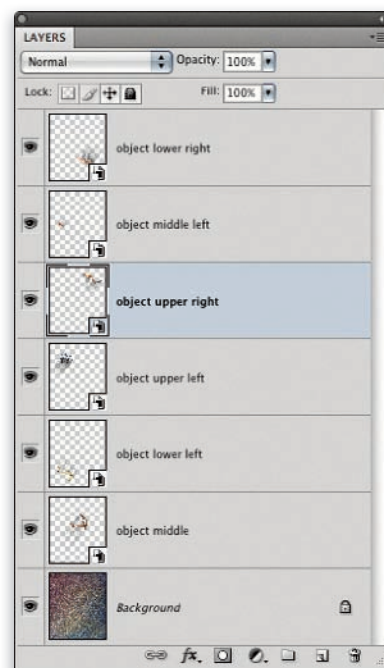


6 A new layer was added and, using the main shadow's opacity loaded as a selection (to keep any painting within the blurred main shadow), I added a second shadow layer to paint in a 'close shadow' that would help ground the object and keep it from looking like it was floating.





7 I selected the object layer and two shadow layers. I then went to the Layers panel and chose Convert to Smart Object (as seen in the upper Layers panel view). This created a single Smart Object layer. I then selected the object and dragged and dropped it into the background image (as seen in the lower Layers panel view, which I was in the process of renaming). As you can see, the scale was incorrect. However, because this was a Smart Object, I could resize, rotate and reposition it anyway I (or the art director) wished. To resize, I just selected the Smart Object and applied a Free Transform command. However the object was transformed, it didn't alter the object's pixels.

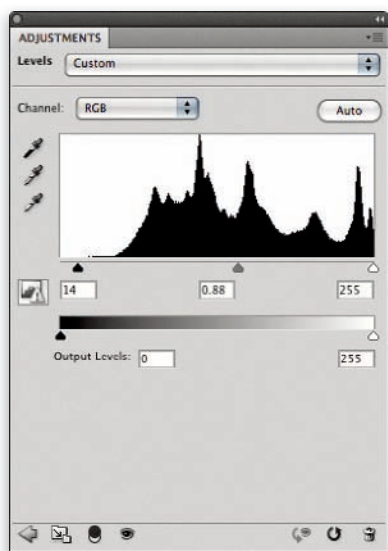
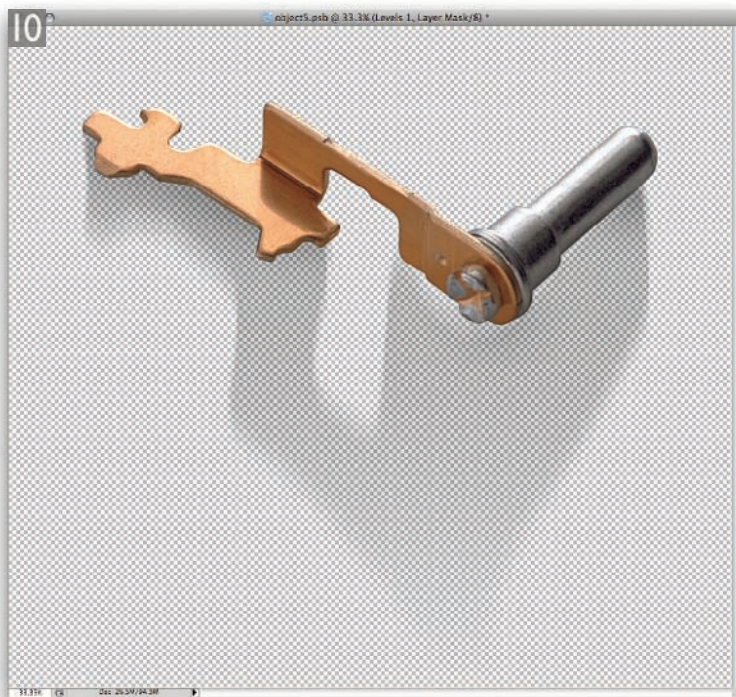


8 This is what the final composite looked like after adding all six of the objects onto the background. The layer stack with the named layers as Smart Objects is shown on the right. In a perfect world, this would be the finished piece but, don't you know, the art director decided that the upper right widget needed work. Smart Objects to the rescue! I just double-clicked the upper right object to edit it.

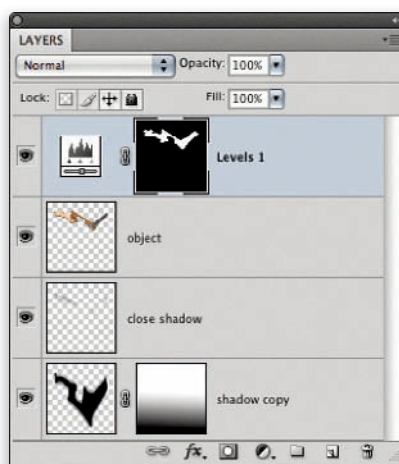
9



9 When you open a Smart Object for editing, you are presented with this dialog shown above. Read it and understand it before proceeding. What it basically means is that Photoshop will open the embedded object in a new window and allow you to do whatever edits you need to do. Once that is finished, you must save the document without doing a Save As, otherwise the link will be broken (which is really bad).

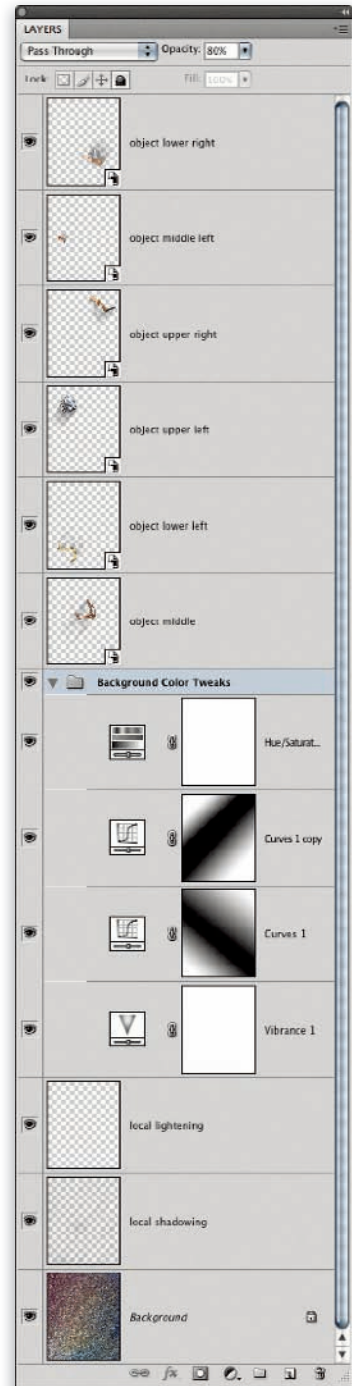


10 With the combined image still open, the upper right Smart Object was opened as a separate file showing its own layers and allowing a tone tweak to the widget. I used the object's transparency mask to create a layer mask for the Levels adjustment. Once the tweak was done, I saved the file without doing a Save As. Once saved, the adjusted image showed up in the main image with the updates displayed.





11 After saving the modified Smart Object, the edits were updated in the main image. After working on all the Smart Objects, I also did some overall adjustments. I added Vibrance and Hue/Saturation adjustment layers as well as a pair of graduated Curves adjustments. The other layers I added were some tone adjustments just above the Background layer to lighten and darken areas in a streaked pattern. In order to create them, I created a new channel, chose Filter ⇒ Render ⇒ Clouds, adjusted the density and ran a Blur ⇒ Motion Blur filter. I loaded the channel as a selection and filled with white for the lightening layer, and then inverted the selection and filled with black for the shadowing layer.



Adding atmospherics

I used to shoot a lot of tractors for Case (I never shot for Deere but I did shoot a Deere on this assignment). The ad was to promote a head to head shoot-out between Case and John Deere tractors. The company was doing various events around the country and I was assigned an event in Arizona to shoot while both tractors with drivers would be available. The events were being videotaped and made available to smaller dealers and tractor buyers – hence the ad for the video.

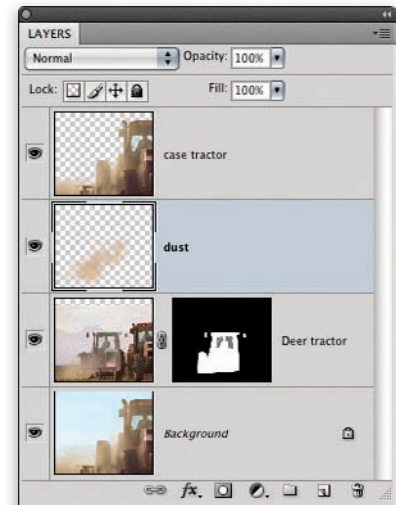
We had arranged to have the tractors and drivers very early in the morning, not long after sunrise. We had equipped the drivers with radios so the art director and I could give the drivers instructions about position and speed. I don't know if you've ever driven a tractor (I have), but they don't turn on a dime and they don't go very fast. They're like slow lumbering beasts, but the intent of the ad (note in Figure 7.10 the headline changed) was to imply a race with the Case tractor the winner. Try as we might, we just couldn't get both tractors in the right place at the right speed with the right amount of dust flying. This was clearly a job for Photoshop (something the art director and I both presumed we would need to do anyway).



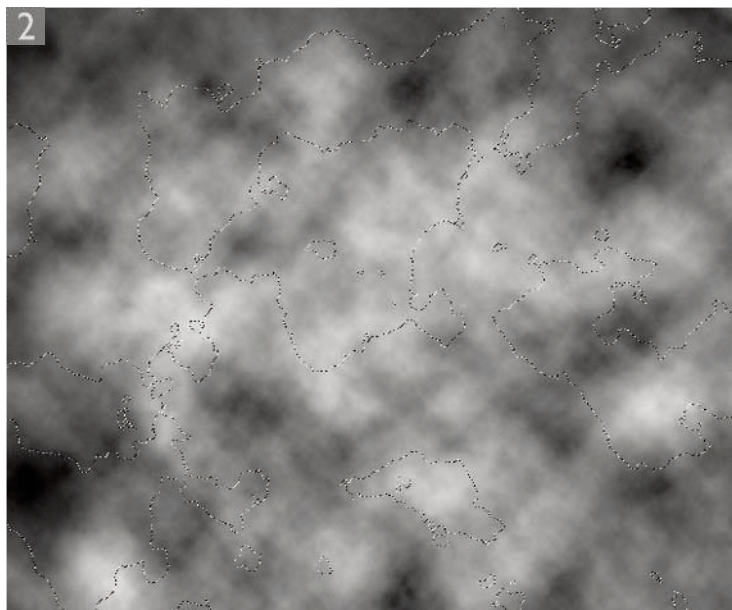
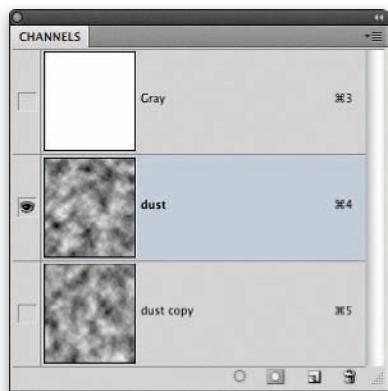
Figure 7.10 Top left is a scan of the actual layout. Below that are the two component shots that were chosen from several hundred frames of 35 mm film shot and above is the final image as used in the ad.



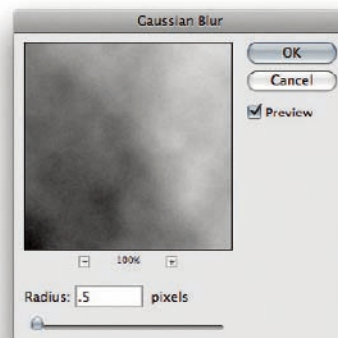
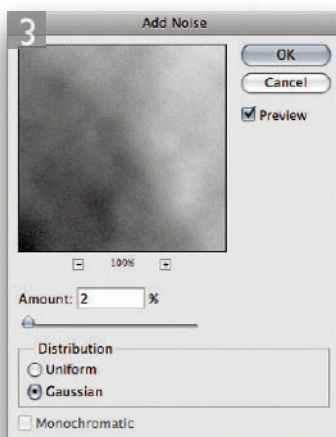
Figure 7.11 This figure shows the composite with and without the dust added. The dust added a sense of ‘atmospherics’ that helped integrate the two images.



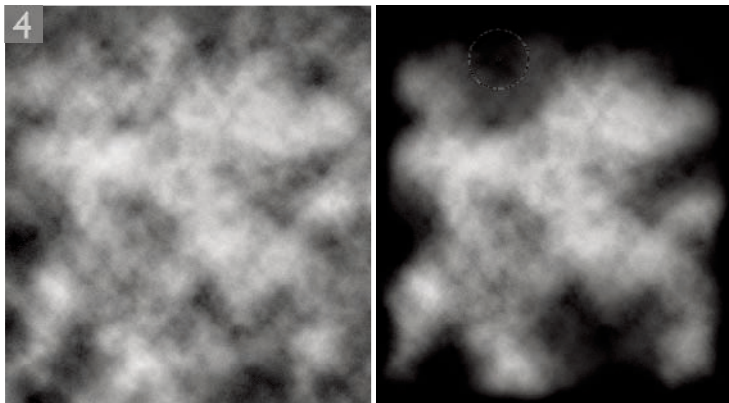
1 The first step was to actually study what the real dust looked like in the shot where the tractor was stirring up lots of dust. This is an important step because before you can add something you need to really understand what it is you are adding. The dust has a sense of motion to it and reacts to its surroundings. So, just painting in with an airbrush would have made it look more like smoke, rather than dust caused by the tractor. Close study actually gave me the clue as to which tool to use: the Clouds filter. So, rather than try to point with a custom brush, I would point through a selection.



2 I created a new grayscale document, added a new channel named dust and used Filter ⇒ Render ⇒ Clouds to produce a random 'cloud' pattern. But, in reality, I duplicated the dust layer and reran the filter to get a second iteration of the Cloud filter (no two are ever the same) and used the Cloud copy, loaded as a selection, to modify the first dust channel. This allowed me to lighten or darken certain areas, but through the effects of a Cloud-based selection.



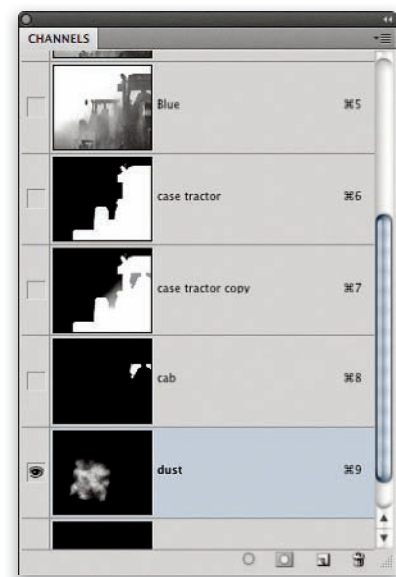
3 I needed to make further modifications. I used Filter ⇒ Noise ⇒ Add Noise to break up the pattern and then ran a very gentle Gaussian Blur to soften the noise.



4 Prior to bringing the dust channel into the main image, I needed to modify the perimeter of the channel to make sure there would be no hard cut lines when painting through the mask. I painted all around the edges and selectively darkened some areas to give more of a feeling of tendrils of dust.



5 I copied the dust channel to a new channel in the two-tractor combo image and clicked to make it visible as well as the RGB image's Green channel. That way I could see the dust channel over the image for position and size. I rotated and sized the dust area of the channel where I needed to add the most dust in the composite.





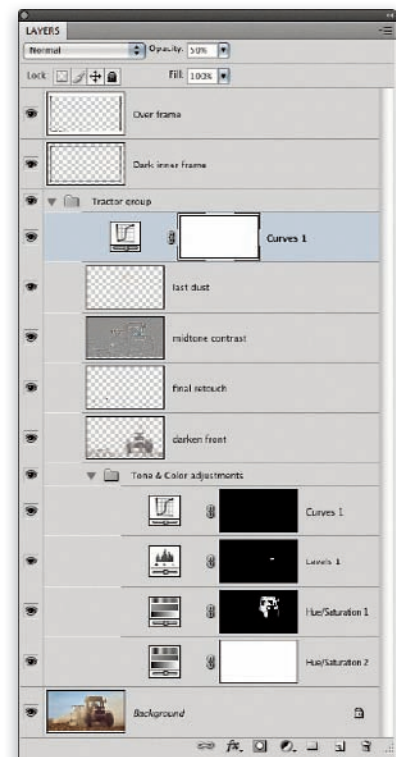
6 With the dust channel loaded as a selection, I started painting with a lowered opacity. It's OK to play when you are doing this – the feeling of the atmospherics needs to build up as a process. I could always use the eraser tool to lighten up the effect.



7 In this step, I selected the marquee tool to take the active selection and move it to a different region. Once moved, I did more painting to build up more dust in different areas.



8 The next step was to select the eraser tool to reduce some of the areas where the dust effect got too strong. I could also have used a layer mask and painted into the mask with black to remove the excess dust. Also remember that a dust mask can be useful for erasures – you don't need to only use it for painting through.



9 This shows the final composite with tone, color and retouching as well as the addition of the 'cut-out negative carrier' look as a border around the image. Also note the addition of a midtone contrast layer to punch up the tractor contrast.

Simulating the effect of motion

Still photography is often called upon to give a sense of motion and aside from actually shooting something flying through space, the effects that imply motion usually require some pretty substantial work in Photoshop. In this example, actually shooting the glass flying wasn't really an option. In Figure 7.12 you can see the two original shots and the final result – glass flying as though a sledgehammer has broken the glass. Yes, I did have to break some glass to create this effect, but rather than trying to shoot it, I imaged the effect of motion.

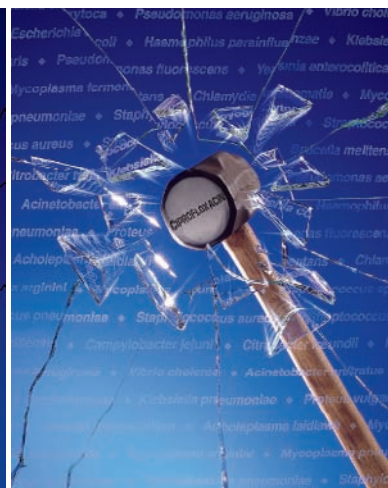
The background image was shot with a static hammer showing through a broken pieces of glass with frosted type placed prior to breaking it. The glass was held in place in a wooden frame. Pieces of glass from the same break (and a few extras – I had lots of broken glass to choose from) were suspended on wire via hot-glue and shot under the same lighting as the main shot. The ability to shoot element shots under the same lighting conditions is critical to having a convincing final composite.



The original background shot.



The pieces of glass shot.



The final composite image shot.

Figure 7.12 The original shots were done on 4 x 5 color film and scanned. The main shot was done first and the glass pieces were positioned so the final assembly would match the lighting of the main shot.

Embossing the word

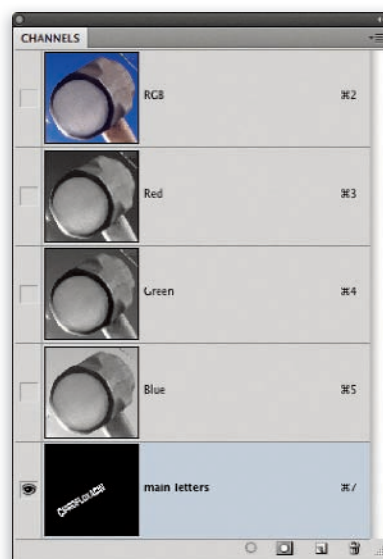
Prior to doing the motion effects, the first job in the imaging was to emboss the word CIPROFLOXACIN onto the hammer's front face. I have no idea what the word means, that's not my job. The image was done for a pharmaceutical firm so I guess it's the name of a drug. The letters were imported as paths into Photoshop and positioned over the face of the hammer, then a selection was made and turned into a channel. Then channel operations (chops) were used to offset multiple channels and create the effects of the emboss.

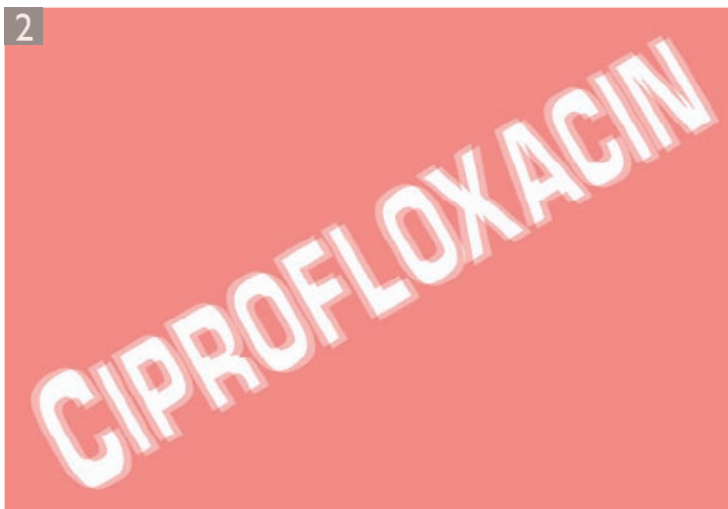
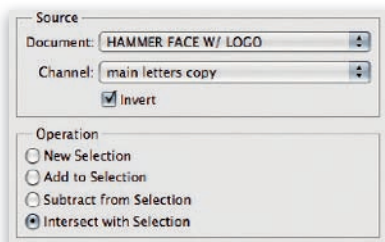
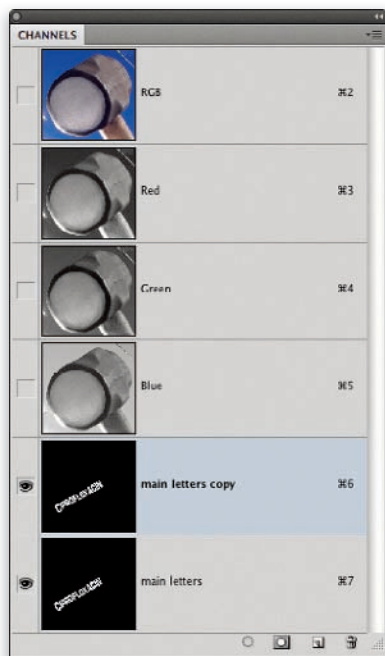


1 Step 1 was to create a base channel from which the resulting chop will be used to create offset selections. Several selections were used to build up the final emboss. The Channels panel shows the position relative to the hammer's front face. All of the chops were done by duplicating this main channel, offsetting it and then using the Load Selection dialog and picking the correct channel source and operation. It's important that all the chops were done on duplicate channels, not on this main channel, because I would always need this channel to constrain the other channels against.

Emboss vs. Deboss

Note that the following steps are being used to show how to do an emboss. The exact same steps can be used to make a deboss, the primary difference being the direction of the offset and reversing the lighting directions. This series shows an 'innie' but the 'outie' is pretty much the opposite.





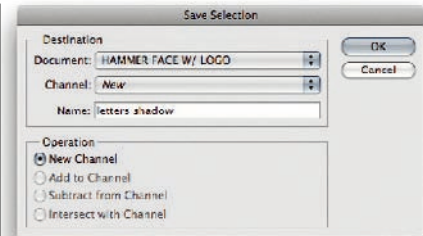
2 Next, I duplicated the main channel and (with the move tool selected) offset it using the arrow keys to nudge it into position. It's useful to click the display eyeball for both channels so you can see the relative positions. The copy channel was offset down and to the right and would become the cast shadow of the emboss.



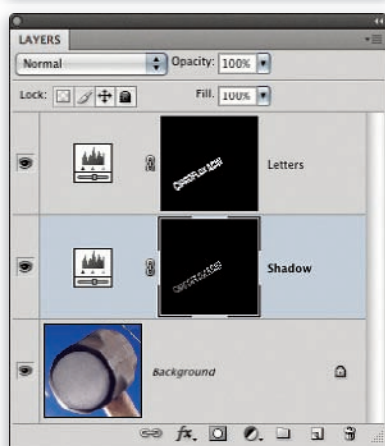
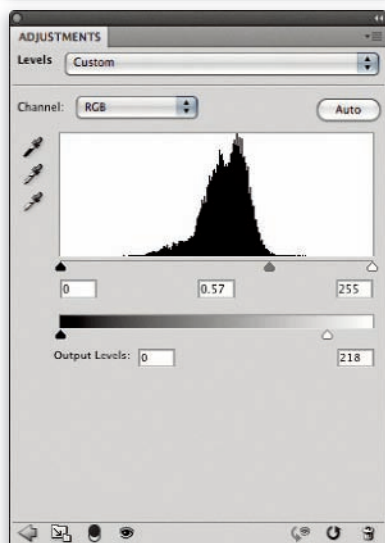
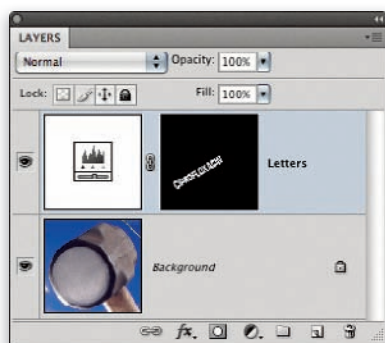
3 I retargeted the main channel and loaded it as the selection. Then, using the Load Selection dialog (cropped for clarity), I set the selection load to be the main letters copy channel, selected the Invert option (because I needed the selection inverted prior to the operation) and set the Operation option to be Intersect with Selection.



4 This is the result of the preceding step, where you can see the result of the offset selection intersecting with the original main channel. This was the critical result of the channel operations. Once I got the correct result (which depended entirely on correctly setting the Load Selection dialog) I saved it as a new channel.



5 This is the saved channel that would be used to create the shadow that gave the emboss its shape. Variations on this operation could be a slight blur on the copy channel to give the impression of softer light or varying the offset to indicate a deeper or more shallow emboss. The main channel would be used to give a sense of overall darkness, the shadow channel used to indicate depth and the final touches would be highlights used to add realism and light. The steps used to create the highlights channels were the same as those shown here but with the channel offset up and to the left.



6 I loaded the main type channel as a selection and added a Levels adjustment to darken the area of the hammer face as the base for the type and also darkened the output levels. Since the brushed pattern of the metal was pretty consistent, I had no need to do an offset of the pattern. If the texture had had a discernible pattern I would have copy/pasted an offset of the pattern to help indicate depth.



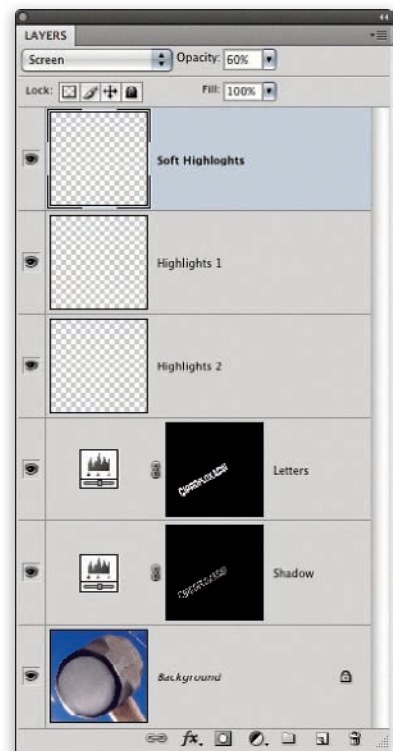
7 I then loaded the Type shadow channel as a selection and applied another tone adjustment to make the shadow area even darker. The amounts you do something are a matter of taste and experience. There really are no absolute numbers here, just a 'feeling' that makes it 'look' right.



8 Rather than apply another adjustment layer, I added a new layer set to Screen blend mode then loaded one of the highlight channels as a selection and filled it with white. I had now made two separate highlight channels with slightly different softness edges to get a feeling of both a softer light and a harder light hitting the face of the hammer. I actually used the lighting on the hammer itself as a guide to how to create the highlight channels.



9 You can now see the results of the previous highlights having been added. But the last step needed some hand work. Using a new layer (also set to the Screen blend mode), I zoomed way in and lightly applied soft brush strokes at the corners where highlights would naturally concentrate. This hand work was needed because the emboss needed a sense of reality that chops often fail to introduce. It's the hand work that gives spontaneity and a more believable result. The Layers panel view shows the stack created for the emboss.

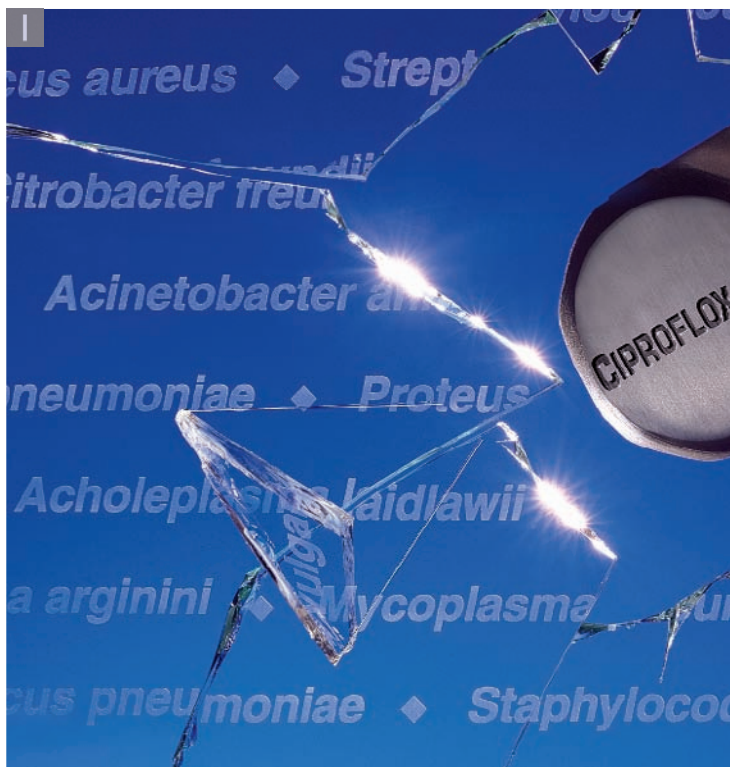
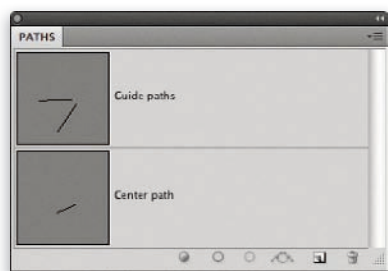
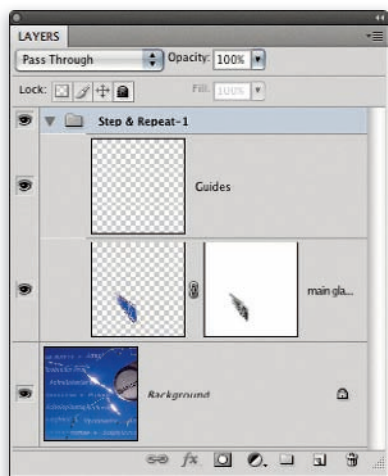




Adding motion

To do this final composite, the shot of the broken glass had to be outlined to create individual pieces. And, yes, that was a chore. The best solution (although not the fastest) was using the pen tool to create individual paths that were then turned into a selection. I've saved you from those gory details!

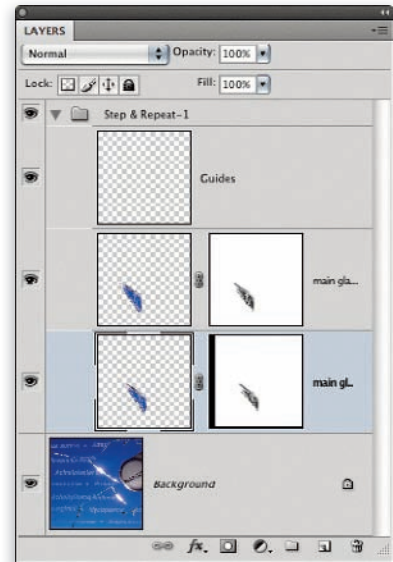
The key to giving a sense of motion in a still image is to use a step and repeat process to give the feeling of movement and then add speed lines (highlight giving a clue to the direction of the movement). It's not hard but is tedious, so try not to be in a hurry.



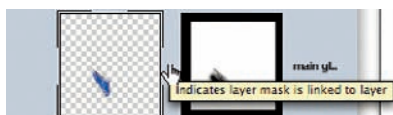
1 I selected a piece of glass to work on from the outlined glass image and copy/pasted it as a new layer to the main image. I used a layer mask to remove the solid portion of the blue interior of the glass so the background could show through. Without the mask, you would not see the background of the letter showing through and the glass piece would appear opaque. After positioning the glass, I created paths to give myself a direction for the movement and for scaling. Ultimately I would also use the paths to paint the speed lines with.



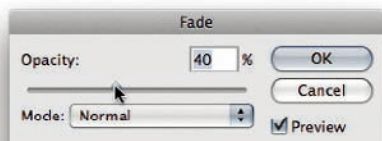
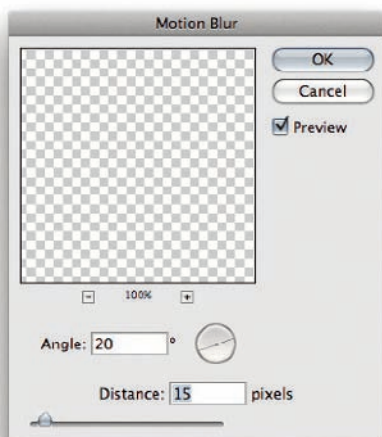
2 I duplicated the glass piece layer and moved it underneath the original layer. I then used Edit ⇨ Free Transform to both move and resize the layer smaller. I used the guidelines for position and size. I knew that once I got all of the step and repeat layers combined, I would always need to go back and fiddle with the exact positioning, but the guidelines gave me a good starting point.



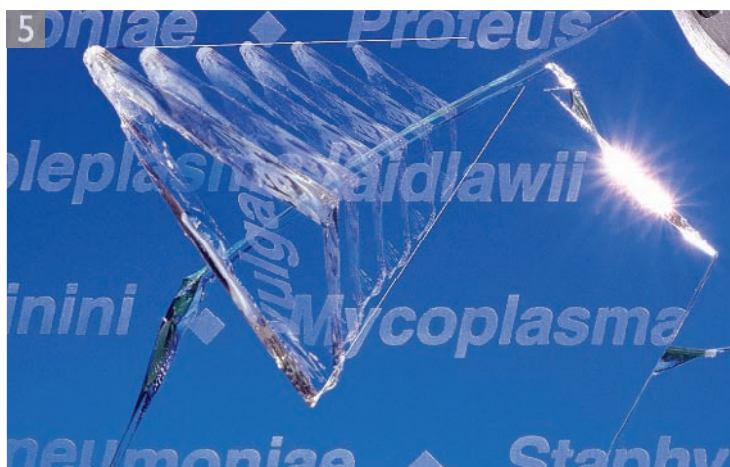
3 After the sizing and repositioning, I needed to readjust the layer mask to keep the second layer from showing through the original layer. Here you can see I had partly painted away the offending parts on the second layer's mask.



Unlinking the layer mask.



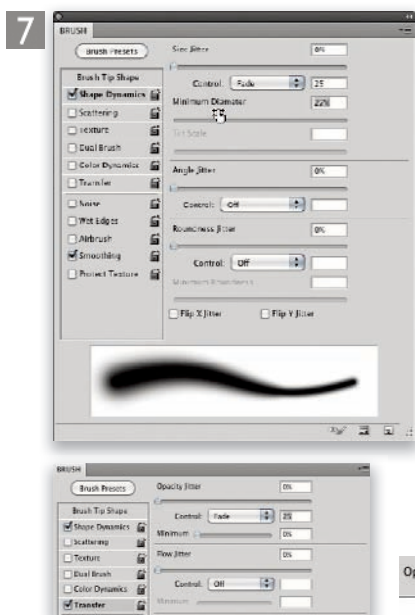
4 At this stage, I had followed the previous steps to add five additional copies of the original layer. I wanted to start making position adjustments but rather than have to go to the Layers panel, I used the keyboard command to select the target layer. With the move tool selected, a **Ctrl** (Mac) or right-mouse click on the area showed a context menu of the current layers with data under the cursor. It was then a simple task to select which layer to target.



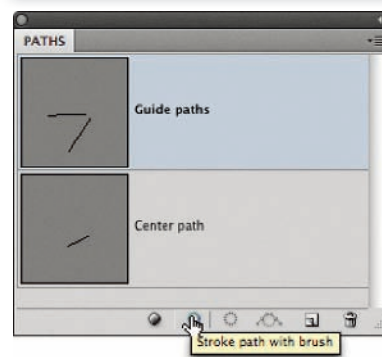
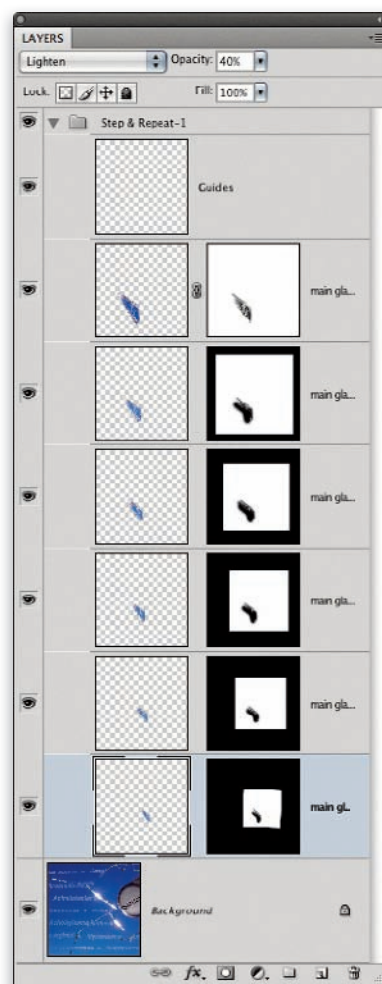
5 To aid in giving a sense of movement, I gave each of the layers a small dose of Motion Blur. But there's a problem: if a layer has a linked layer mask, for some reason the ability to fade the filter is disabled. (Don't ya just hate that?) To work around this limitation I unlinked the pixel layer from the layer's mask so I could run the filter and then fade the results. I used a 15 pixel distance Motion Blur with an angle to match the layer's direction of movement. After running Motion Blur I set the Fade Opacity to 40%. I then continued the blurring and fading on the remaining four copy layers.

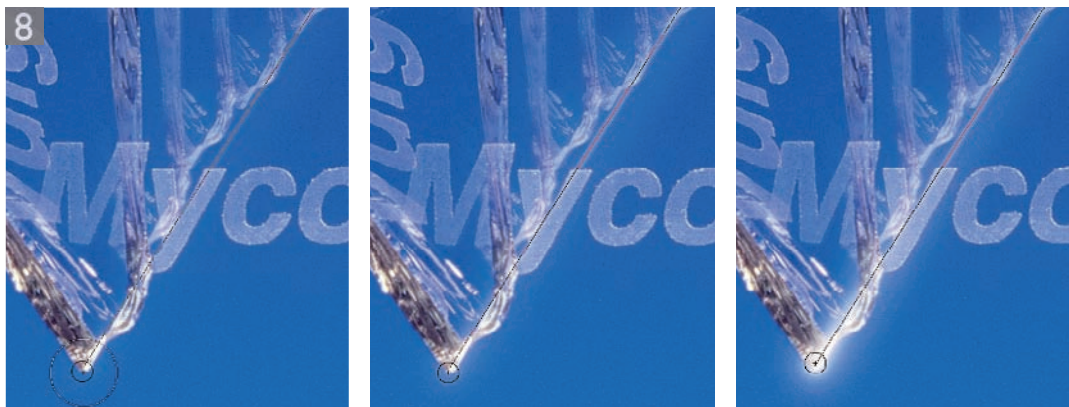


6 Prior to painting in the speed lines, I adjusted each of the step and repeat layers' opacity to go down as the layer got further away. The second layer's opacity was set to 80% and the last layer's opacity was set to 40%. This gave the layers a feeling of disappearing and aided in the sense of the main layer coming forward.

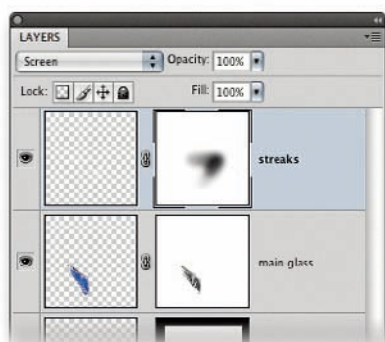


7 Next, I needed to paint the speed lines, which required some preparation. I wanted the brush size to fall off as the line was painted. That required changing the Brush Tip Shape Dynamics. I adjusted the brush's Shape Dynamics Size Jitter to Fade to a maximum of 27% of the starting size. Then I adjusted the Transfer Opacity Jitter also to Fade at 25% for the starting opacity. I then adjusted the overall Brush Opacity to just 10% so I could build the effect gradually. The last stage was to select the correct path to use to stroke along. I'm a poor 'painter' so, wherever possible, I use a path to make sure I paint straight lines.





8 The process of painting the guide lines really was a buildup of multiple low-opacity strokes performed by starting with a larger brush size, stroking, reducing the size and stroking again. I started large and adjusted the size smaller as I built up the effect. Since I was using a 10% starting opacity and I had got the brush size and opacity set to fade, it took multiple strokes to build up the effect.



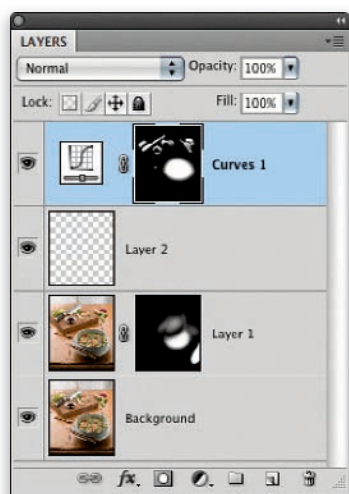
9 The final step in this process was to do the same series of steps on the center speed line and then apply a layer mask to adjust the overall falloff of the lines. And yes, this entire series of steps was repeated for each and every single piece of glass (a total of 18 pieces). Hey, that's why we make the big bucks – the willingness to do what it takes to do a convincing and realistic image manipulation (and bill by the hour for it).



10 The final composite required umpteen hours of work (I really don't know how long it took but the invoice was for 12 hours of imaging) and almost 90 layers (counting the embossing).

Enabling Lens Blur as a Smart Filter

Smart Filters are mainly intended for use with value-based filters only and are not intended for use with filters such as Lens Blur. However, it is still possible to enable Smart Filters to work with the Lens Blur filter. Go to the File ⇒ Scripts menu in Photoshop CS5 and choose Browse... This opens a system navigation window and from there you will want to use the following directory path: Adobe Photoshop CS5 folder/Scripting/Sample Scripts/Javascript and select: EnableAllPluginsforSmartFilters.jsx. Once you have located this script, you can click Open or double-click to run it, which will then show a Script Alert dialog. If you wish to proceed, click 'Yes'. The Lens Blur, as well as all other filters, will now be accessible for use as Smart Filters.



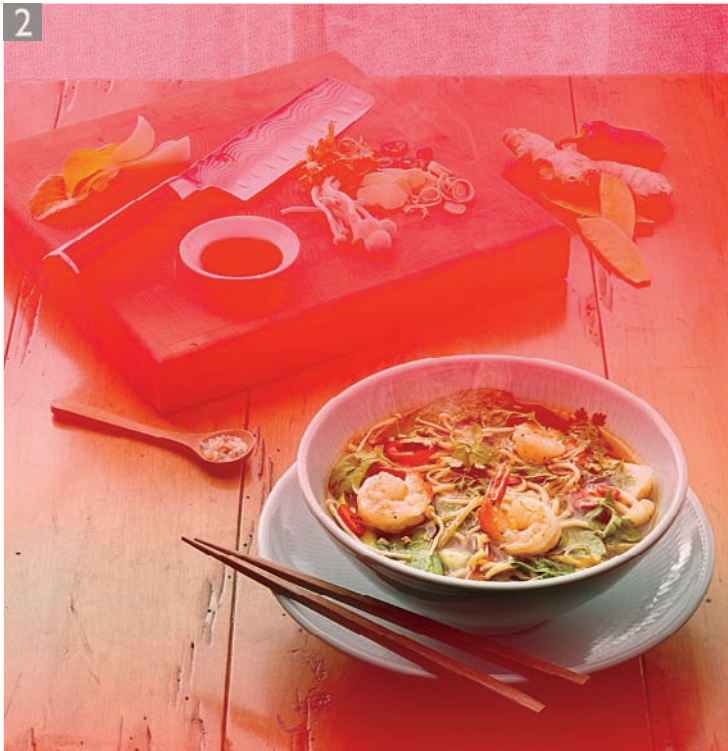
1 Here you can see the photograph that we started with, where we had so far added a few retouching layers to improve the appearance of the image.

Adding lens blur

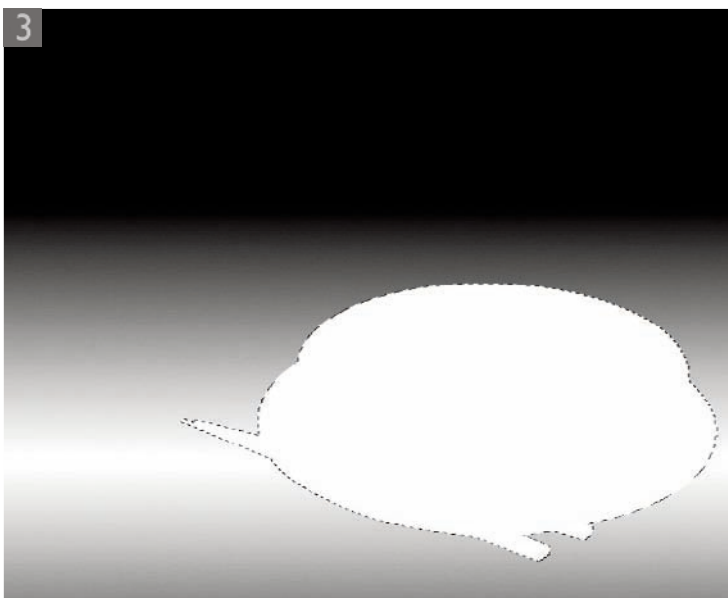
One of the disadvantages of using smaller format digital cameras is that you often end up with a much greater depth of field than you would get when using a large format plate camera such as a 5 x 4 Sinar. We know a lot of still-life photographers rather like this large format look, so in the technique steps shown here, we wanted to show how you could use the Lens Blur filter to simulate a shallow depth of field effect, in which only the main subject appeared to be in a plane of sharp focus.

The Lens Blur filter is really useful should you wish to add convincing-looking blur effects to your photographs. What's different about the Lens Blur filter is that rather than simply blurring the pixels (which is what the Gaussian Blur filter does), it applies an adaptable iris-shaped blur and also allows you to control the way the highlights burn out.

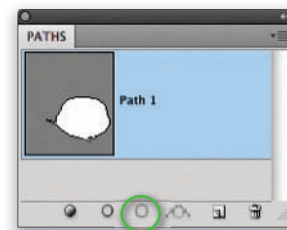


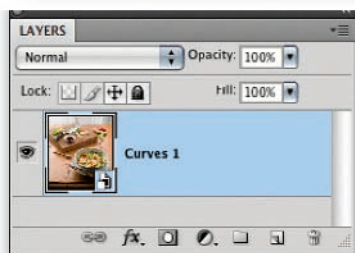
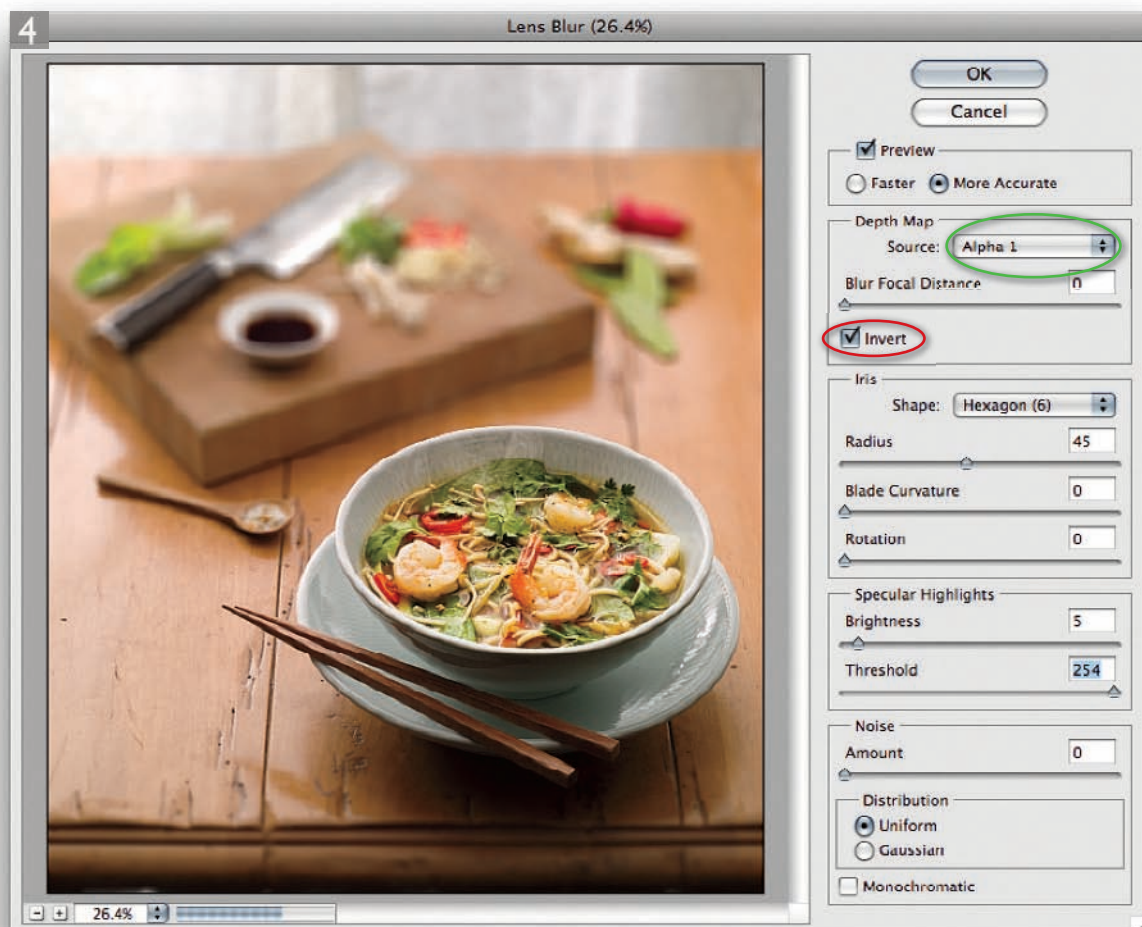


2 In this step we added a new Alpha 1 channel via the Channels panel, switched on the channel visibility and selected the gradient tool in reflected gradient mode. With white as the foreground color, we clicked roughly on the center of the soup bowl and dragged with the gradient tool down to the bottom of the photograph. This added the reflected gradient mask shown here as a red channel mask overlay.



3 We then used the pen tool to draw a pen path outline of the soup bowl and chopsticks (note: when drawing with the pen tool, we did so in the Add Path mode). Once the work path was complete, we converted this to a new path and then dragged the path to the Load path as a selection button (circled). We then selected the Alpha 1 channel to make it active and chose Edit ⇒ Fill, to fill the selected area with white. The only other thing we did at this stage was to deselect the selection and lighten the mask slightly using a Curves image adjustment.





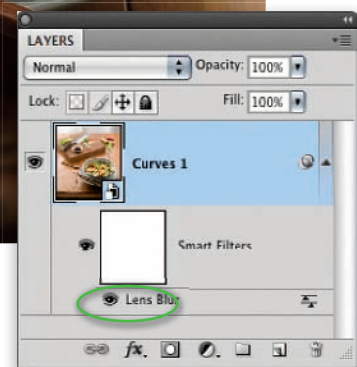
4 We were now almost ready to apply the Lens Blur effect, but first, we selected all the layers in the Layers panel and chose Filter ⇒ Convert for Smart Filters. This converted the multi-layered image into a Smart Object, showing a single layer with a Smart Object icon in the bottom right corner of the thumbnail. There are a lot of slider controls in the Lens Blur filter dialog, but the ones that matter most are the Radius slider (which controls the amount of lens blur) and the Specular Highlights sliders, which determine how the highlights blow out in the brightest parts of the photograph. We also wanted to make use of the mask that was created in Steps 2 and 3, so we selected the Alpha 1 channel as the Depth Map source (circled green) and left the Blur Focal Distance at the zero setting. This is how we achieved the shallow depth of focus effect you see here in the preview window. We also inverted the mask (see check box circled in red) so that the white portions of the Alpha 1 mask now protected the image from becoming blurred, while the black portions of the mask became the most blurred and the gray mask tones allowed varying degrees of blur across the photograph.

5



Photo: © Jeff Schewe

5 Here you can see the finished photograph with the Lens Blur filter effect shown as a smart filter in the Layers panel. It was now possible to edit the Lens Blur filter settings by double-clicking the Lens Blur filter item (circled), which would then reopen the Lens Blur filter dialog shown in Step 4 and allow us to re-edit the filter settings.

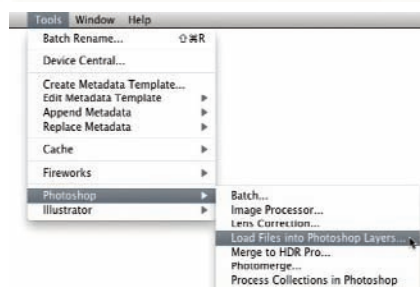
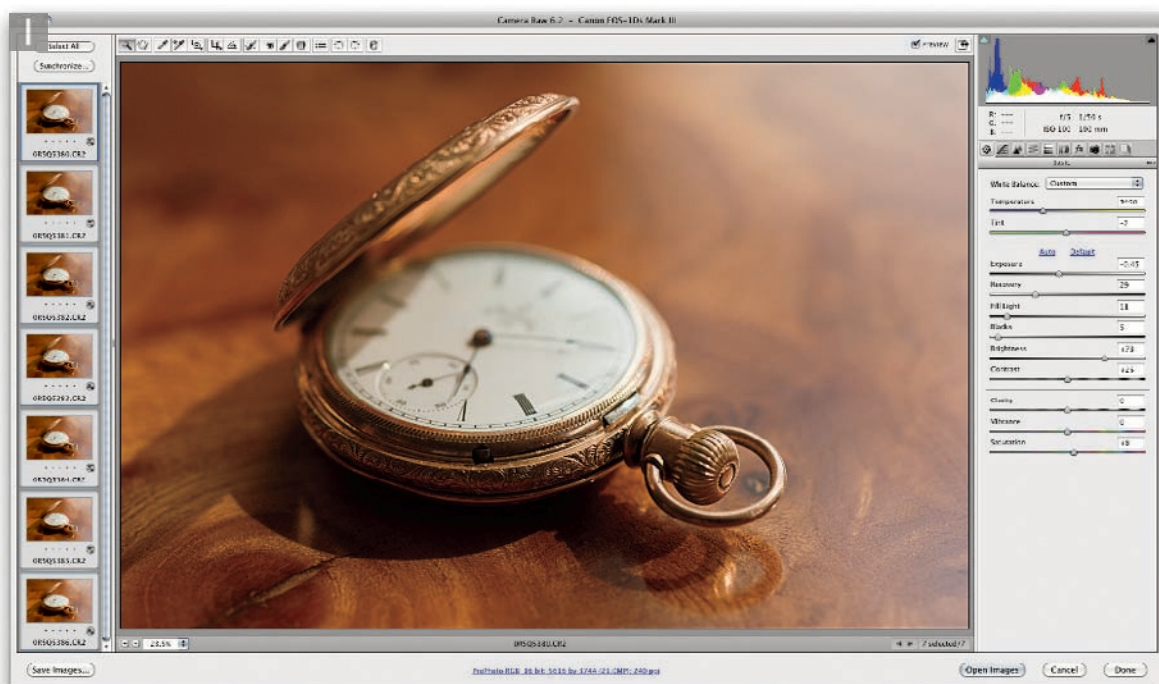


Scheimpflug principle

Named after Austrian army Captain Theodor Scheimpflug, it's a geometric rule describing the plane of focus where the lens plane and the film plane are intentionally altered out of parallel using camera movement to achieve an optimum plane of focus for the subject.

Extending the depth of field

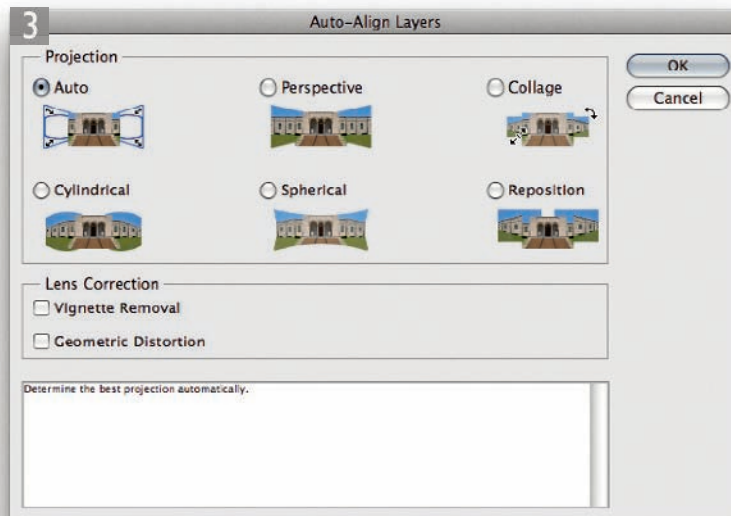
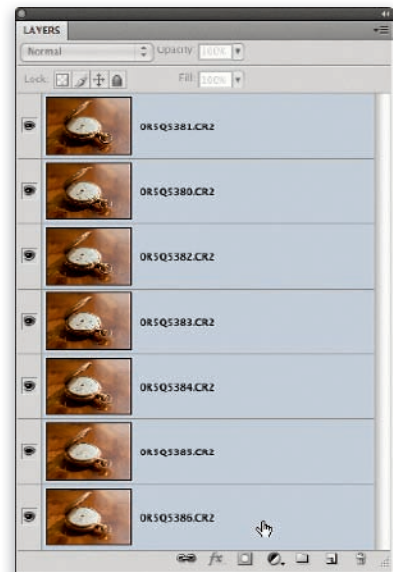
Photographers have always faced the problem of a limited depth of field. You can stop down the lens, but then you need either more light or a slower shutter speed. You can use a view camera and try to use the Scheimpflug principle, or you can use Photoshop CS5's improved stacking to assemble multiple captures and blend them to achieve photographically impossible depth of field. Focus stacking, cool huh?



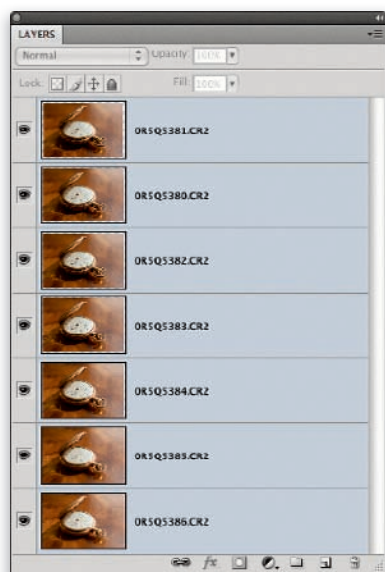
1 The digital captures shown above were all shot with a 100 mm macro lens at f/2.8 on a Canon EOS 1Ds MkIII while locked down on a tripod. They were brought into Camera Raw to optimize the settings – primarily to lighten the midtones and preserve highlight detail with Recovery. After syncing all the settings, I clicked the Done button. Back in Bridge, with the same images still selected, I went to the Tools ⇨ Photoshop menu in Bridge and chose Load Files into Photoshop Layers.



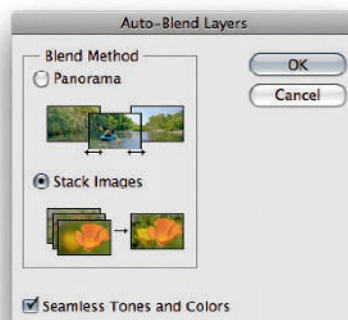
2 After Photoshop has loaded all the raw files as individual layers in Photoshop, some initial alignment had to be done prior to blending the layers. In the Layers panel I selected all of the layers.



3 With all of the layers selected, I went to the Edit menu in Photoshop and chose Auto-Align Layers. Since the images were shot with varying planes of focus, this changed the watch size slightly on each capture layer. The Auto-Align command resized the images and aligned them based on the content of the individual images. This step was required prior to blending them together for focus stacking.



4



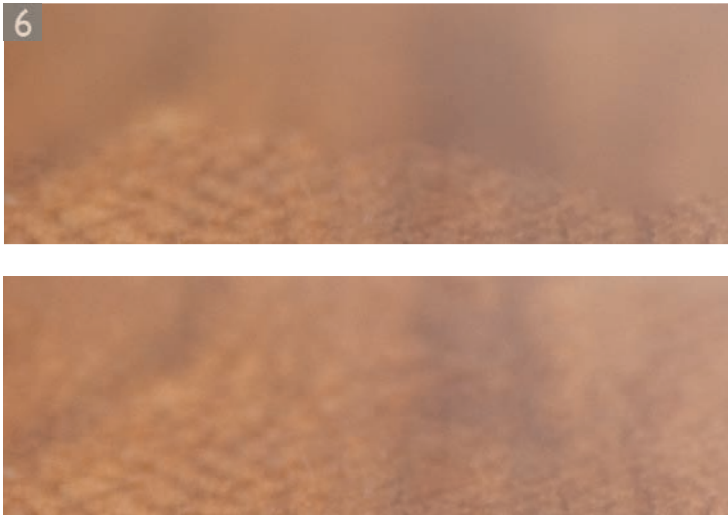
4 The Layers panel on the left shows the result of the Auto-Align processing. You can see the top images were resized down and have transparency around the edges. Once aligned, the next step was to use the Auto-Blend Layers command (also found in Photoshop's Edit menu). This brought up the dialog box shown above. The Blend Method chosen for focus stacking is Stack Images and I also needed to check the Seamless Tones and Colors option. This kicked in the command's logic to try to achieve an optimal blending. It does a pretty good job overall, but will usually need a bit of help after the blend.



5



5 After Auto-Blend had done its business, the results were quite good. The processing produced layer masks that selected the sharpest portions of the layered images. There are usually a couple of things wrong. First, since the layers had been resized, one would typically see uneven blends at the edges. This can be fixed by cropping, but the other problem takes some hand work (see next step).



6 To manually fix the out-of-focus issue shown above (the other common problem), I copied the bottom layer, moved it to the top and repainted the layer mask to soften the transition. The final image below had minor spot healing to retouch some of the watch imperfections (I left some because it's a nice patina) and I applied a touch of midtone contrast increase.

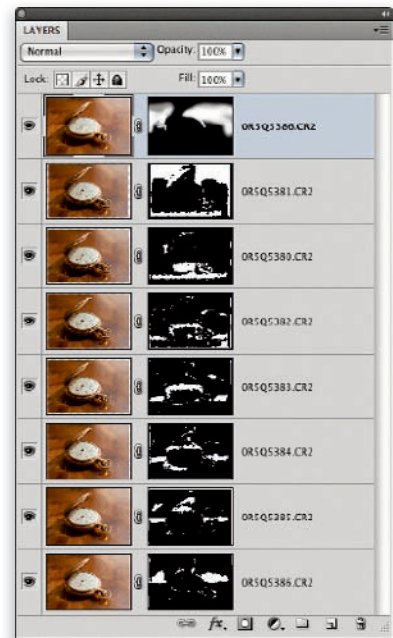


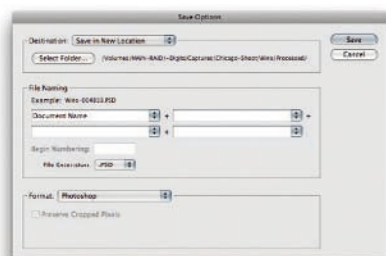


Figure 7.13 This shows a studio shot view of the wine pour setup, snapped at the same moment as the main wine pour shot used here.

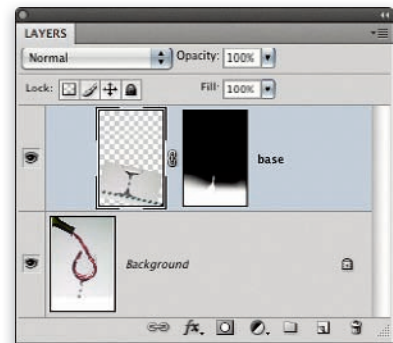
Merging studio exposures

Martin asked me whether I knew how to do a pour shot. I laughed and said, yes (it's what I used to do for a living). So when Martin visited Chicago for some shooting for this book, we decided to do a wine shot that would be composited to create an 'impossible shot'. We shot it using a Phase One P45+ back on a Sinar 4 x 5 view camera using high-speed ProPhoto electronic flash to freeze the motion (Figure 7.13). The flash duration was about 1/10,000th of a second. We used a laser trigger release so the wine being poured would trigger the flash.

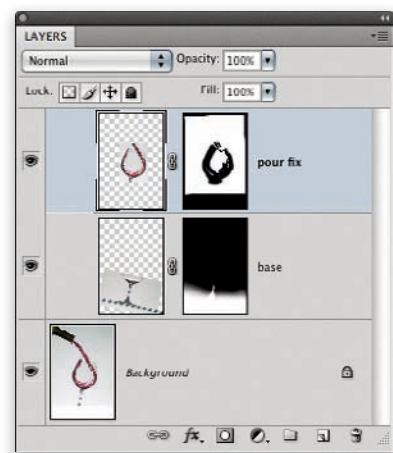
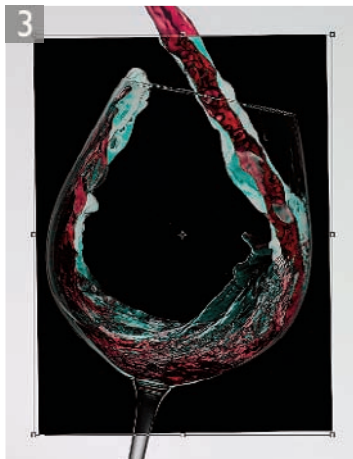
The 'impossible' aspect of the final image is that wine being poured out of a bottle doesn't end nicely. It sort of dribbles out to nothing. As a result, the challenge was to get not only a great pour but enough element shots so the final composite could be pieced together from multiple components. Figure 7.14 on page 273 shows the final composite with all 13 layers.



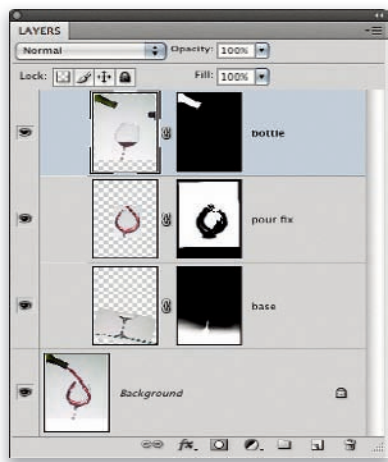
1 I opened the ranked captures from Bridge in Camera Raw filmstrip mode to adjust the basic parameters of the raw files. I used Camera Raw's Batch Save to process the raw images saved out as PSD files. This is an important consideration because the Phase One raw format saves raws with a .tif extension. So, if you open a Phase One raw and resave it as a TIFF, you will save over the raw file if it's saved to the same folder. Normally I use TIFF files, but for this project I figured it would be safer to use PSD. Note that I also saved the files out to a folder named 'Processed' so the raws would remain separate (just in case).



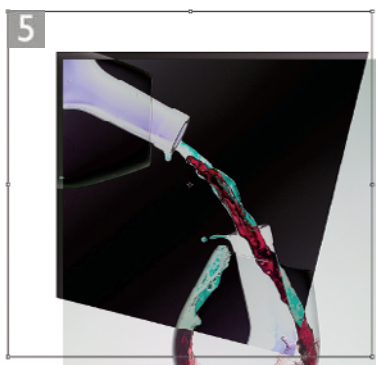
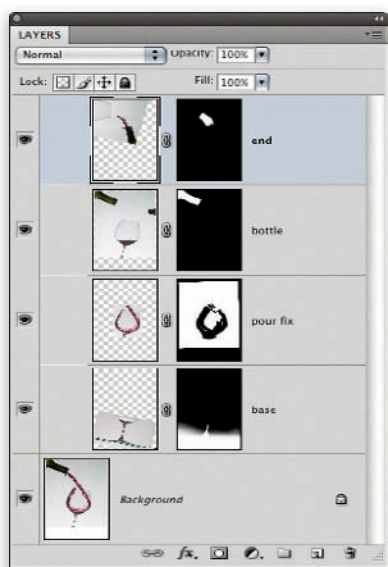
2 After opening the base image, I expanded the canvas and added the image of the full glass cropped to only a portion of the image. The base had to be shot separately because I needed to be able to clamp the pour glass into a fixed place – which of course was not very photogenic.



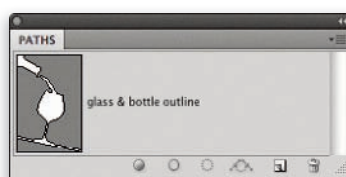
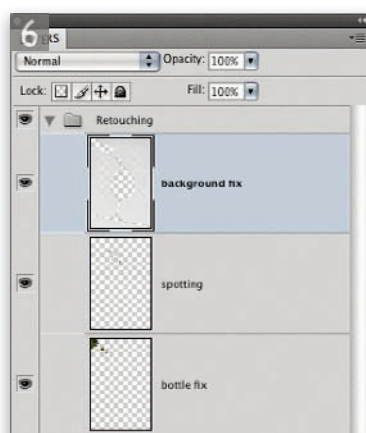
3 I added a second pour shot because the original had an odd thin area inside the glass. Rather than try to retouch it, I just used a second pour. I used a Difference blend mode so I could see the position of both layers while I transformed the second pour shot. On the right is the layer with a layer mask.



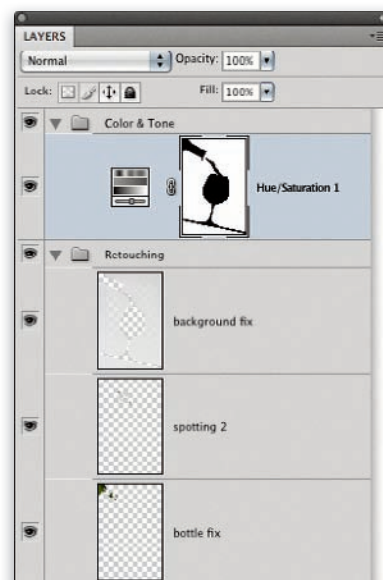
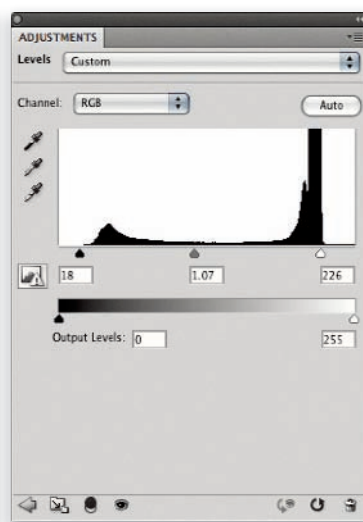
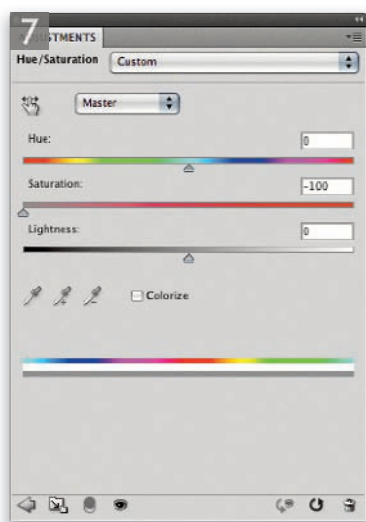
4 I picked an earlier shot that had no wine coming through the bottle (a mistake actually that was nevertheless useful) and positioned it to cover the bottle in the base image that had wine coming through.



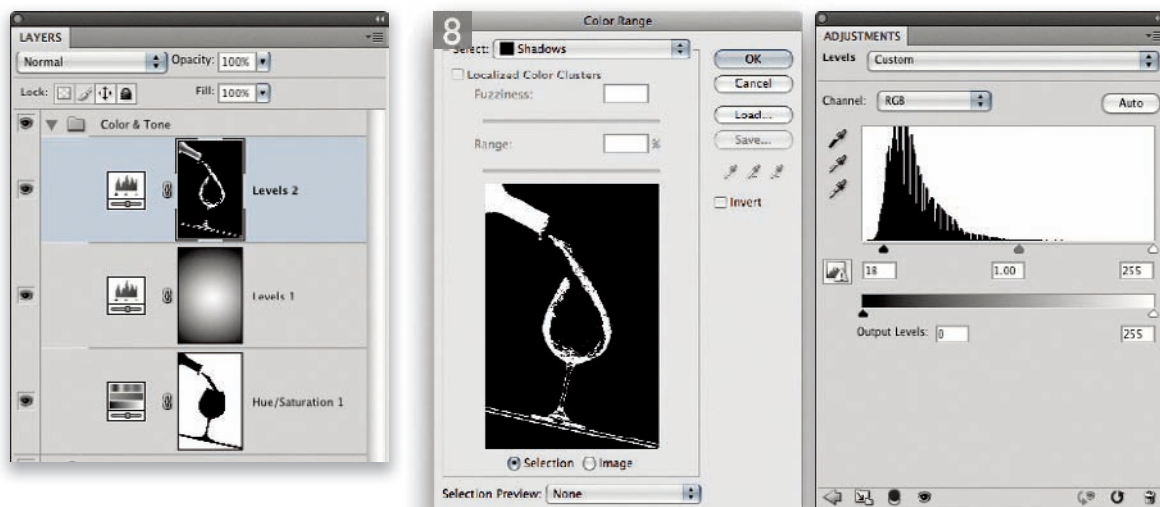
5 If you look back at the Bridge view of all of the images, you'll see I had shot some various trigger delays giving me both early and later shots of pours. Originally I wanted to get an 'ending' pour where the wine ended in mid-air, but that's not the way pours end. So, I took an early shot where the wine was just coming out of the bottle and rotated and repositioned it to look like a pour end. I also used a Difference blend mode to aid in the positioning.



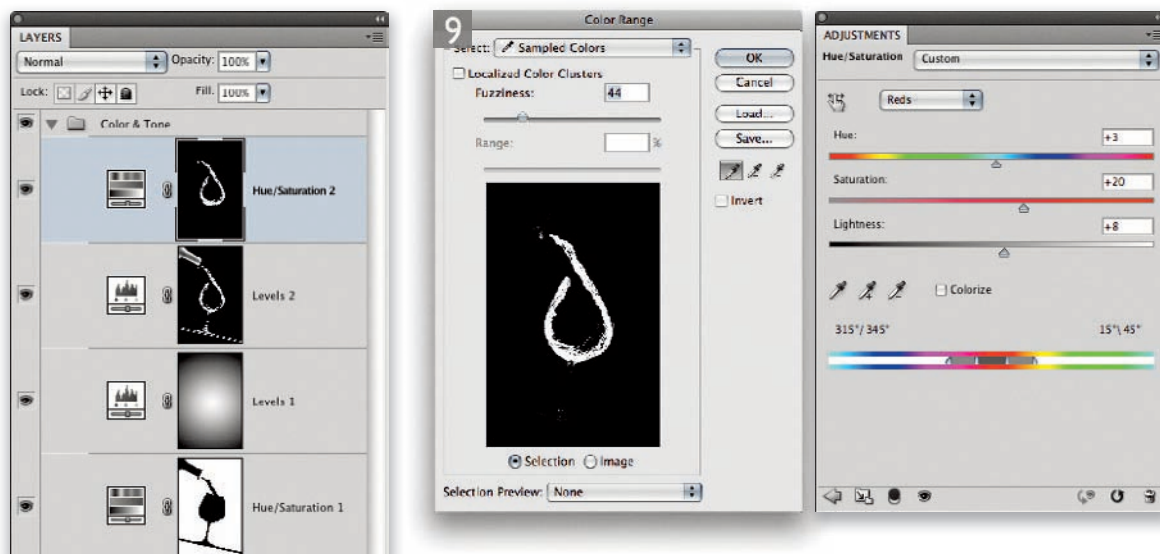
6 I needed three separate layers for the various retouching steps. At the bottom of the retouching stack was a retouching layer specific for the bottle replacement. I used a separate layer for all the other wine- and glass-related retouching. Some were done with the healing brush and some with the clone stamp tool. In both cases, I chose to use the Current & Below option (from the Tool Options bar) for the sampling. The last part of the retouching was to paint in the background fix. This was done using an outline mask to keep the painting off the glass and bottle. To create the outline mask, the pen tool was used to create a path of the wine, glass and bottle. This outline was also used for the layer masks on the adjustment layers.



7 Using an inverted glass and bottle outline selection, I added a Hue/Saturation adjustment layer to eliminate any color cast in the background. Using a minus saturation adjustment was far easier than trying to neutralize the cast using Levels or Curves. The Levels adjustment shown here was used to lighten the center based on a circular gradient added to the layer mask.



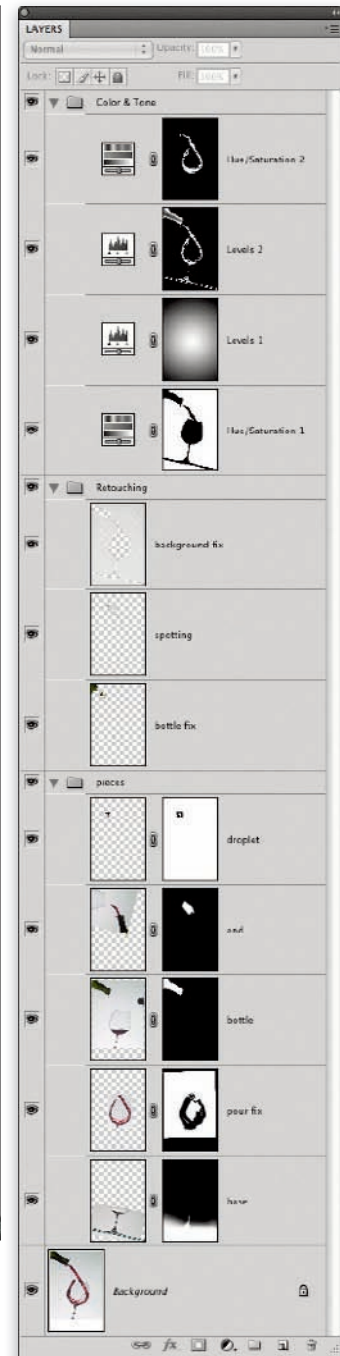
8 The next adjustment was done to pin the black to a good black. When I processed the original images through Camera Raw, I didn't know how the images would end up blending together. So, I processed them a bit flat knowing I could punch things back up in Photoshop later. Here, I used Color Range choosing the Shadows selection option to create the mask.



9 The last step was to adjust both the color and density of the wine. I'll be honest, we didn't pour the 'good stuff'. The wine we poured was actually a mix of several bottles purchased for about \$4/bottle and was recycled between pours. I used noted wine expert Greg Gorman to help me adjust the color to be a good color for a pinot noir, which was appropriate for the glass we shot.



Figure 7.14 The final composite of six different shots, three retouching layers and four adjustment layers. The final image was 19" x 29" @ 300 PPI. The layered file was 1.29 GB while the flattened TIFF was 378 MB. This large final size was without any upsampling and suitable for a large print or poster.



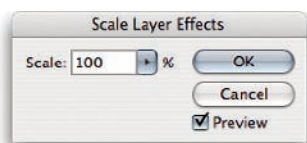


Figure 7.15 When you change the size of an image, the Layer Styles will not adjust proportionally. If it is important to retain the exact scaling, choose Layer ⇒ Layer Style ⇒ Scale Effects and enter a scale percentage that most closely matches the percentage change in image size.

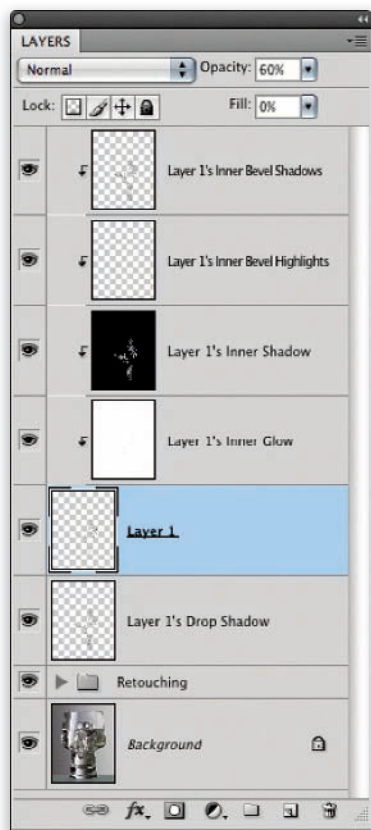


Figure 7.16 Many Layer Styles (but not all) can be deconstructed into a series of layers. Choose Layer ⇒ Layer Style ⇒ Create Layers. Here is an example of how the layer style applied on page 279 would look if it were broken down into constituent pixel layers.

Layer Styles

With Layer Styles you can link various sorts of layer effects to any of the following kinds of layer: a type layer, an image layer, or a filled layer masked by a vector mask or layer mask. A Layer Style can be made up of individual layer effects and these effects can be accessed via the Layer menu or by clicking on the Add a layer style button at the bottom of the Layers panel. Layer styles can be applied individually or as a combination of effects to create a layer style and these can be saved by clicking in the empty space area of the Styles panel. As with adjustment layers, layer styles always remain fully editable.

When you add a new layer style, the Layer Style dialog opens to let you adjust the settings and create the desired layer effect. After you add a layer style, an italicized *fx* symbol will appear in the layer caption area and next to that a disclosure triangle. When you click on this disclosure triangle, an indented style effects layer will appear below containing an itemized list of the individual layer styles that have been used to create the master layer style. This allows you to control the visibility of the individual effects.

Layer styles are not directly scalable. So, if you resize an image the layer effect settings will not alter to fit the new image size; they will remain constant. However, if you go to the Layer menu and choose Layer Style ⇒ Scale Effects, you'll find you have the ability to scale the effects up or down in size (see Figure 7.15).

If you need to work with real layers, you can rasterize a layer style by going to the Layer menu and choosing Layer Style ⇒ Create Layers. This action will deconstruct a layer style into its separate components, placing the newly created layers in a clipping mask above the target layer (see Figure 7.16). You can deconstruct most layer style effects in this way, but be warned that with some layer style effects the rasterized layers won't always produce an identical-looking effect.

Over the next few pages we'll show how we went about using a 'water drops' layer style to add extra water droplets to a still-life photograph of a glass. If you are interested you can see in Figure 7.17 some of the behind the scenes photos of how this photograph was shot.

How to add extra water drops to a glass

Here is an example of a photograph where we wished to add some extra droplets of water that matched those already on the glass. To do this, we added a new empty layer with the Layer Style settings shown over the next two pages applied to the layer and set the Fill opacity to zero. The Layer Style settings used here were originally outlined by Greg Vander Houwen, but you may want to do what we did here and adjust some of the following Layer Style settings to suit the requirements of each individual shot.



1 Layer styles can be used in Photoshop (among other things) to add texture effects to a picture. You will find the 'water drops' layer style used here on the DVD. To load this style on your system, simply double-click the layer style and Photoshop will automatically add this layer style to the Styles panel (see Figure 7.18).



Figure 7.17 This shows the studio setup for the glass shot shown here. You'll notice that we used a monorail camera setup with a Phase One back to capture the main image. Shown also here is the airbrush that was used to add some of the original water drops to the glass.

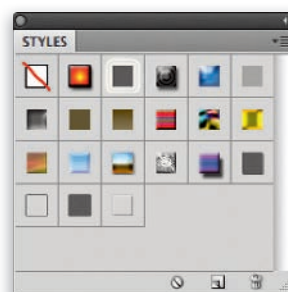
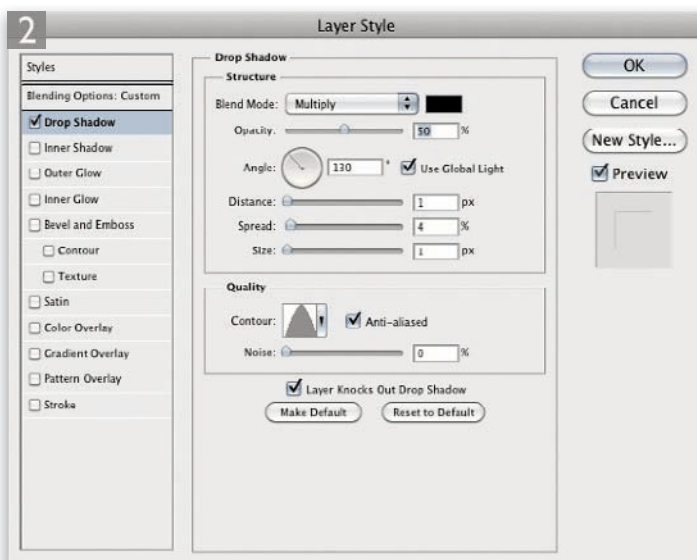
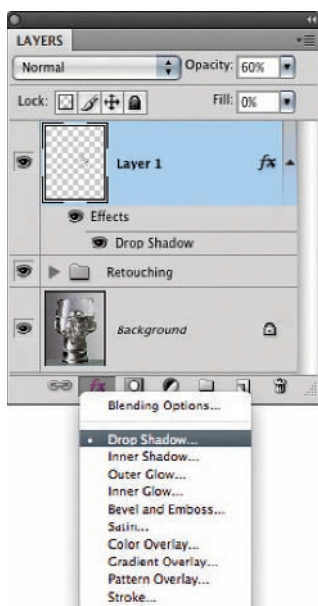
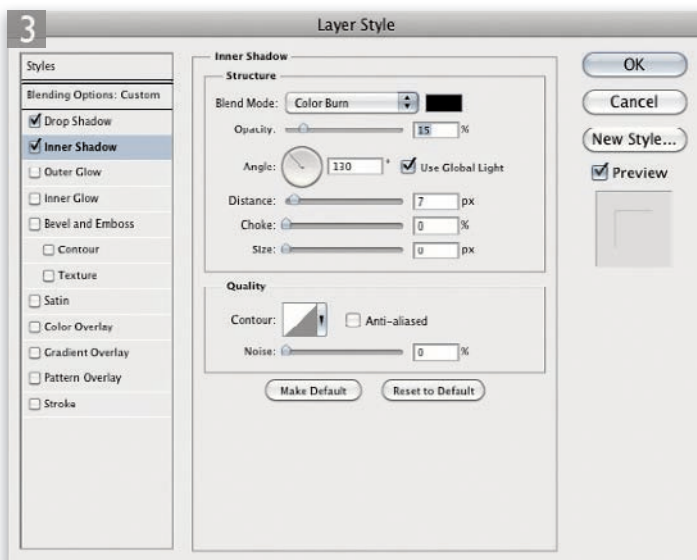


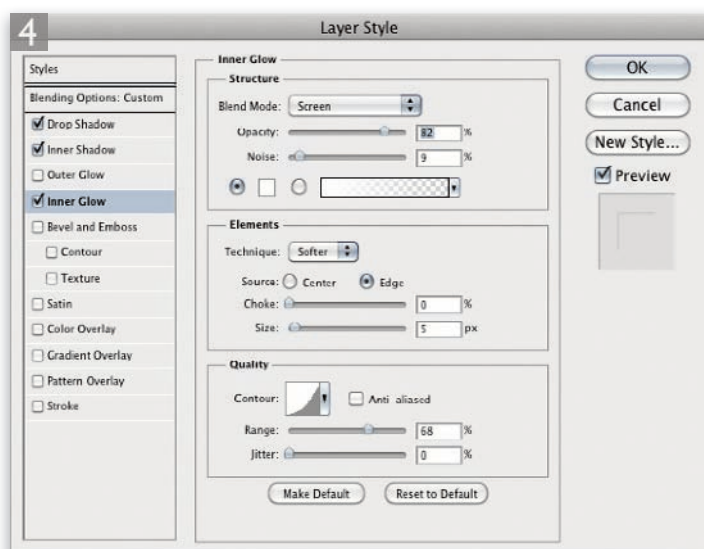
Figure 7.18 The Styles panel.



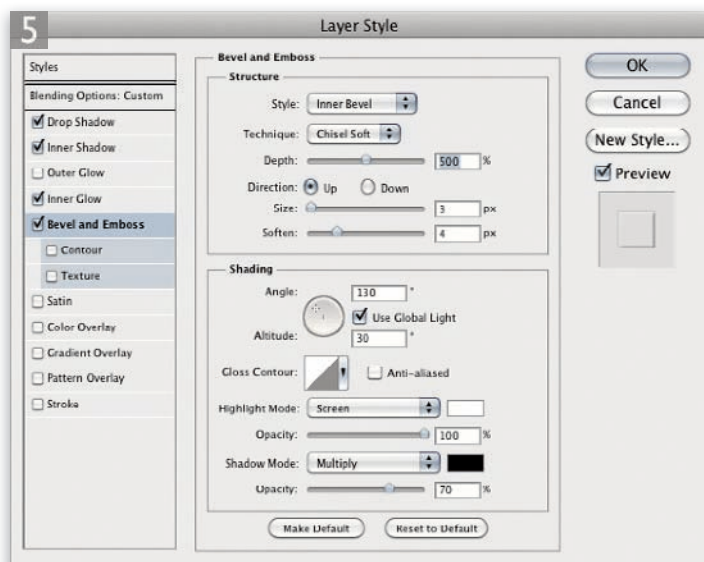
2 The first step was to create the water drops layer style effect. We began by adding a new empty layer where the Fill was set to 0% and then went to the Layer Style menu to add a Drop Shadow layer. First we set the drop shadow opacity to 50% with a Distance of 1 pixel, a Spread of 4 pixels and a Size of 1 pixel. We applied a global light angle of 130° and selected a Cone contour for the Drop Shadow edge.



3 We next clicked on the Inner Shadow style, set the blend mode to Color Burn at 15%, using a Distance of 7 pixels a 0% Choke and 11 pixels Size.



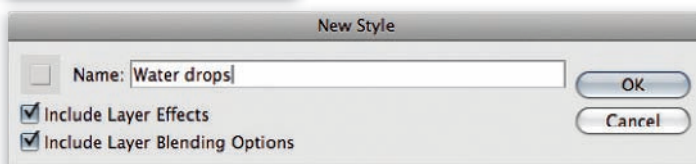
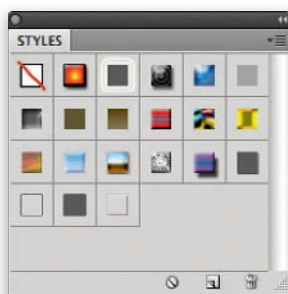
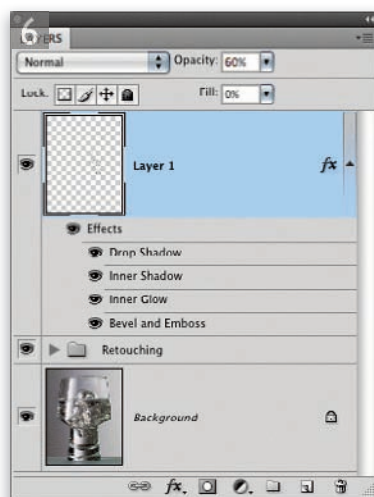
4 We then clicked on the Inner Glow style, kept the blend mode set to Screen, raised the Opacity to 82% and clicked on the color swatch to change the Inner Glow color to white. In the Elements section we selected the Softer option, using the Edge method, with a 0% Choke and a 5 pixel Size. In the Quality section we created a custom contour shape like the one shown here and set the Range to 68% and Jitter to 0%.



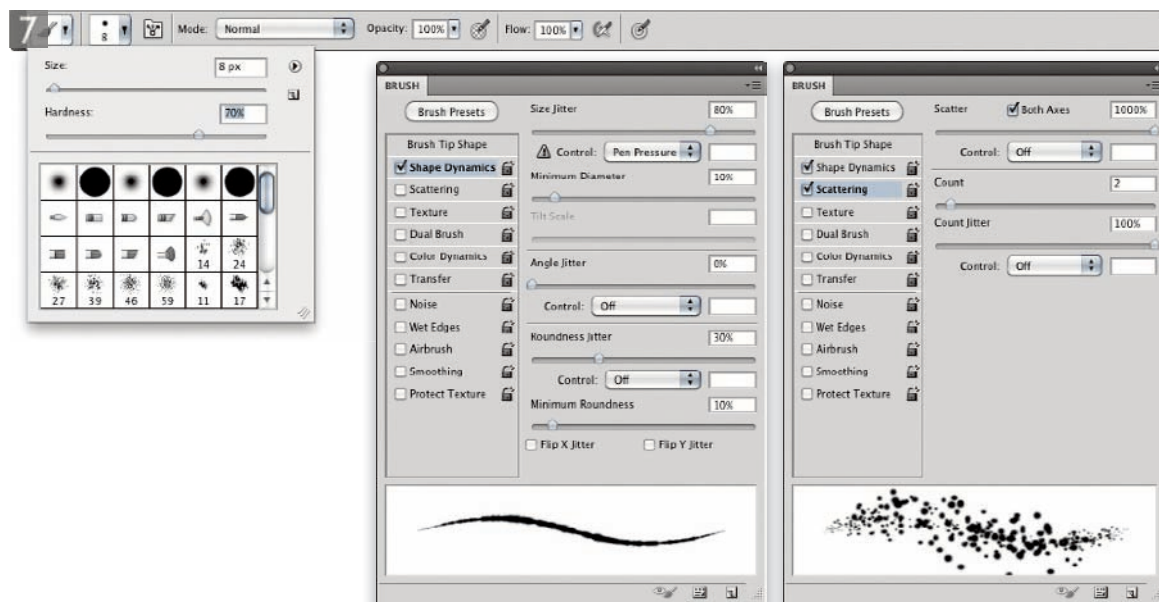
5 Lastly, we clicked on the Bevel and Emboss style. Here we selected the Inner Bevel style with a Chisel Soft technique, using a depth of 500%. We used the Up direction with a Size of 3 pixels and 4 pixels Soften. For the Shading we used the default Gloss Contour shape and blend modes, but set the Highlight Opacity to 100% and the Shadow Opacity to 70%.

Setting user Layer Style defaults

In Photoshop CS5 it is now possible to set your own default settings in the different Layer Style dialog subsections. If you happen to not like the Photoshop default setting, you can create one that suits your needs better and then click on the Make Default button at the bottom in order to set this as the new default for that particular section of the Layer Style dialog. Once you have done this, clicking on the Reset to Default button that's next to the Make Default button will reset the settings for that section to the Make Default or factory-set value (whichever applies). If you ever need to carry out a global reset, you will need to reset the Photoshop preferences when launching the program.



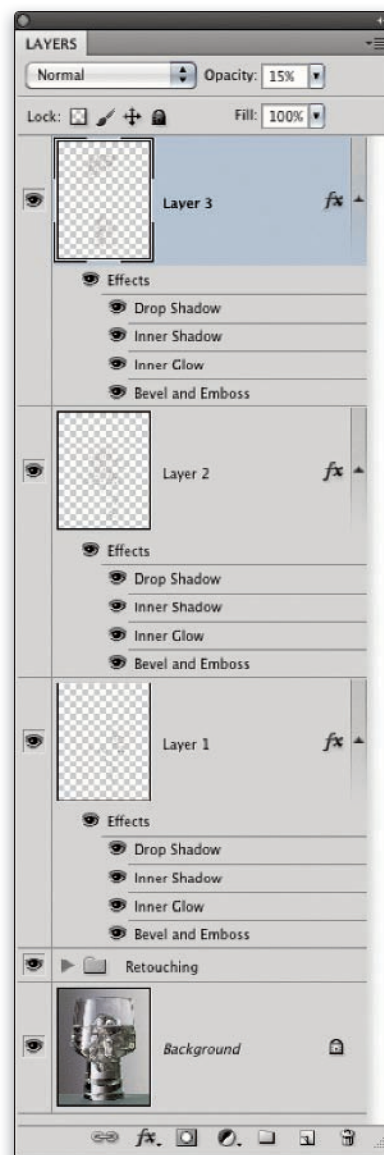
6 Here is how the Layers panel looked after all the layer style options had been added. To save this style, we clicked on the Create new style button in the Styles panel and named it 'Water drops'.



7 After we had created the layer style we needed to create a custom brush setting to paint the water droplets with. Here we selected a small standard, round brush shape with a hard edge. We then went to the Brush panel and clicked on the Shape Dynamics section, linked the pen pressure with the size of the brush and raised the Size Jitter (the randomness of the brush size) to 80%. We clicked on the Scattering option and set the Scatter and Count Jitter to the maximum settings allowed. We chose this combination of settings in order to produce a random droplet effect when painting with the brush.



8 We were now ready to start painting on the empty new layer. As we painted with the brush tool, we were effectively able to paint using the layer style effect and produce the fine droplets of water that you see added here. The layer opacity had to be adjusted to fine-tune the density of the water droplets. You will note that in Step 2 we reduced the layer opacity to 60%, which was done to produce softer looking water drops. To create variable density droplets, we added two further layers, one at 40% and the other at 15% opacity, and painted on these separately, thereby creating a more realistic buildup of water droplets.






Editing layer styles

Double-clicking the layer or anywhere in the layer style list reopens the Layer Style dialog.

Layer what?


The Photoshop User Guide and Help menu sometimes describe the individual layer styles as layer effects, even though the Layer menu, Layers panel and Layer Style dialog refer to them as layer styles. It is unfortunate that Photoshop uses mixed terminology and naturally, this can lead to confusion, but basically, layer styles and layer effects are one and the same thing.

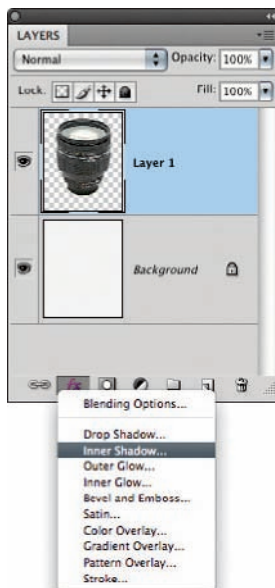
Copying layer styles

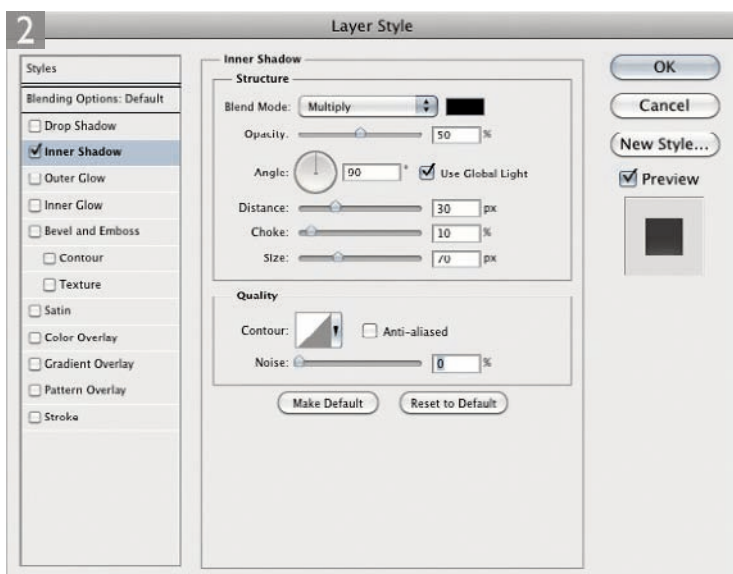
Layer styles can be shared with other layers or files. Select a layer that already has a style applied to it, go to the Layer ⇨ Layer Styles submenu and choose Copy Layer Style, then select a different layer and choose Paste Layer Style from the same submenu. Alternatively, you can  **alt** drag on the  icon to copy the entire layer style from one layer to another. If you don't wish to copy the complete layer style, you can just  **alt** drag to copy just a single style effect from one layer to another layer in the same image.

How to remove edge flare

Layer styles are mostly used to create special effects for logos and type, but in the following steps I thought I would show you a photographic application for the Inner Shadow layer style. Here I wanted to show how you can compensate for edge flare on an object that's been isolated from the backdrop. Just bear in mind that the subject will need to be cut out from the backdrop first, before you apply the layer style.

1 A layer style can be applied to an image, shape or type layer by mousing down on the Add a layer style button in the Layers panel. When you add a new layer effect an italicized  icon appears next to the layer name in the Layers panel.

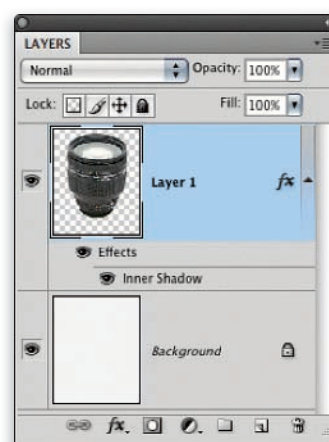




2 In this example I added an Inner Shadow layer style in order to counteract the lens flare that was visible around the edges of the photograph. First I set the Angle to 90° (in order to match the direction of the overhead lighting used in this photograph). I then set the Multiply Blend Mode Opacity to 50% and set the Distance to 30 pixels, the Choke to 10% and the Size to 70 pixels.



3 This combination of settings proved sufficient to reduce most of the edge flare in the photograph. You will notice in the Layers panel below how the layer style appears indented in the Effects list associated with the current layer. To re-edit the settings, all you have to do is double-click the layer style in the list. You can also toggle, showing and hiding individual effects by clicking on the eyeball icon next to each effect.



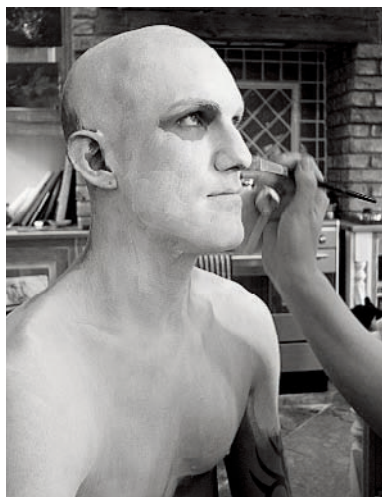


Figure 7.19 This shows our model, Daniel, in the process of having white body makeup applied in preparation for the cover shot.

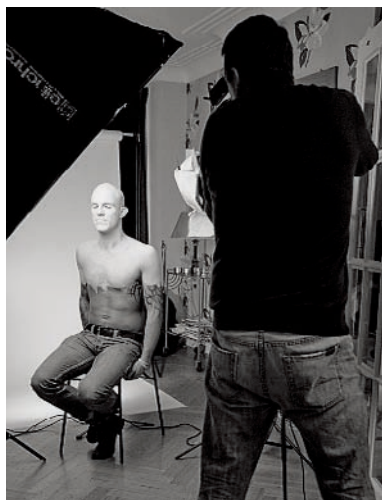


Figure 7.20 This shows our model, Daniel, being photographed by Martin in London, using a fairly simple lighting setup and plain backdrop.

How we created the cover image

With any book it is important to have a cover image that entices the reader and conveys something about the book's contents. In this instance, because the book is subtitled 'The Ultimate Workshop', we wanted the cover to illustrate this concept by photographing a model to look like a porcelain bust with the map of the brain of a well-educated Photoshop user. The idea for this came from looking at classic phrenology head busts, which typically feature a map of the brain that is meant to illustrate how the personality traits of a person can be derived from the shape of their skull. In the 19th century phrenology was quite influential in neuroscience and psychology, though even back then it was still regarded by many as a pseudo-science. However, it seemed like a good idea to take this as an inspiration for creating a Photoshop-user's head. Maybe we could even describe this as the science of 'Photoshopology'?

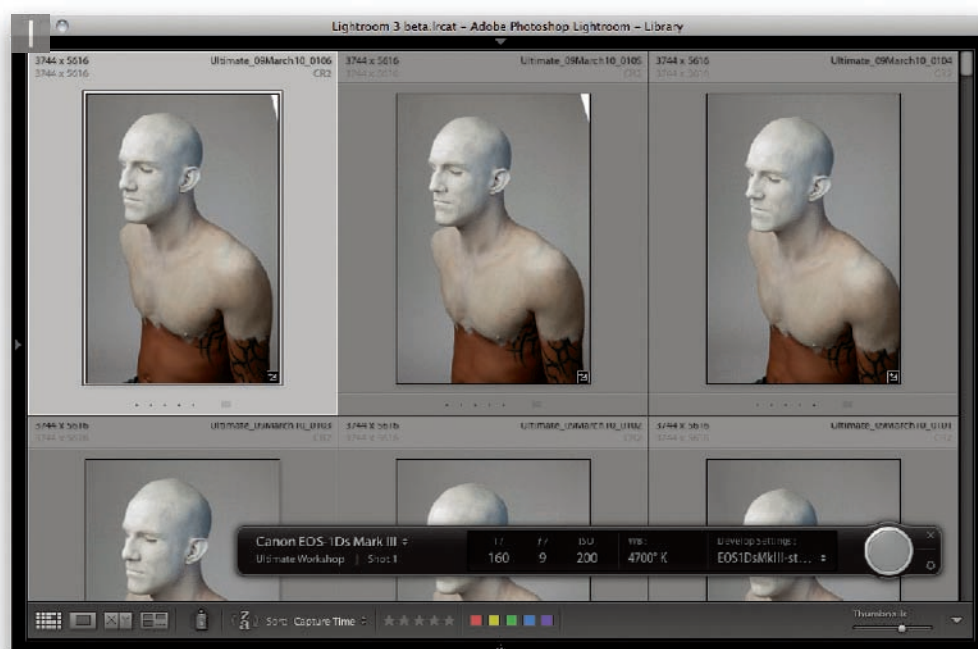
As you may be aware by now, Martin is based in London, England, and Jeff in Chicago, Illinois, and much of the communication that's required for the production of this book is handled via the Internet, with us both making use of Skype® and iChat®. One of the neat things about Apple's iChat service is that it now offers a 'screen sharing' feature whereby an iChat user can allow other iChat users to share their desktop screen views. Obviously, this is something that you only want to do with people you can trust, because it is just like offering someone a seat at your computer and giving them the ability to access anything they want from a remote distance. OK, so we trusted each other enough that this wasn't a problem. The big advantage of being able to share our computer screens was that Jeff could watch the shoot Martin was doing in London and see the photos download into Lightroom in almost real time and have the chance to 'art direct' (which was something Jeff rather enjoyed doing for a change).

Martin began by casting for a suitable model with a good-looking bald head. We chose Daniel, who you can see pictured in Figure 7.19 having his makeup applied by Martin's wife, Camilla. Daniel needed to look like a porcelain bust, so several layers of white body paint were applied, especially where it was necessary to cover up the tattoos on his chest and shoulders. For the lighting, Martin wanted to have a light gray backdrop with a soft sidelight coming from the right, to which a couple of blue-filtered lights were added on both the left and right to kick in a subtle hint of

color on the sides of the head and the shoulders. The initial tests were pretty close to what we wanted, although as you can see in Step 3, in the Photoshop retouched version, Martin needed to add more blue color to the body to balance this with the color of the head. As you read through the following steps you will see how Jeff was able to monitor the shoot's progress via iChat and comment on the best images to select for the final retouch. Also, when Jeff was later to shoot the porcelain head in his studio in Chicago, Martin was able to watch this taking place via his office in London and likewise comment on the way the photo was looking. All that remained was to assemble the elements and here Jeff enlisted the help of David Willett, an art director he had worked with on many shoots in the past, to help advise on which would be the best fonts to use to create the new lettering. We wanted this to match as closely as possible the original lettering on the bust and also be easy to read.

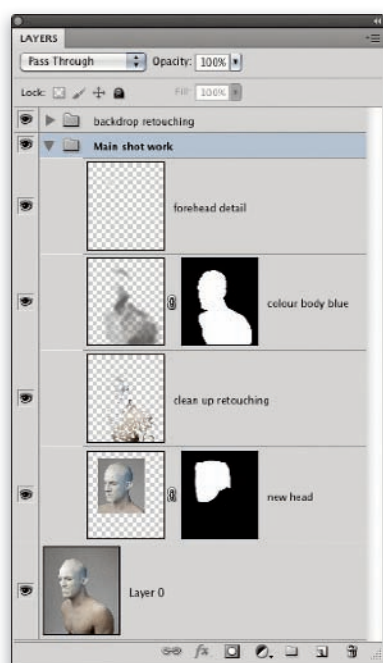


Figure 7.21 During the shoot, Martin was able to communicate live with Jeff in Chicago via an Apple iChat screen sharing connection.



1 This shoot began in London, with Martin taking the initial photographs of our model, Daniel (see Figure 7.20), and using the new tethered shooting feature in Lightroom 3 to do this. Meanwhile, Jeff, who was in Chicago, was able to watch the photos as they downloaded via an Apple iChat screen sharing setup.

2 Once the shoot was complete, both Martin and Jeff were able to look through the photos together in Lightroom and select the two images shown here in the Survey view mode. It was felt that the shot on the left had the best body shape, while the one on the right offered the best head position.



3 The next step was to take the two photos that had been selected in Step 2 and merge the head with the body. Martin then added further layers to tidy up the body makeup and balance out the color between the head and the rest of the model's body.



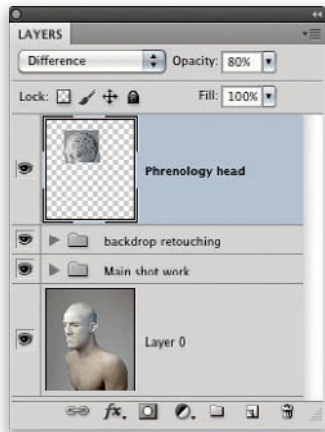
4 As was mentioned earlier, Jeff had been able to observe the shoot that took place in London and had already sourced a porcelain phrenology head from a local prop house. Now that the retouching of the Daniel shot was underway, Jeff knew the exact angle required for the shot he was going to do of the phrenology head (see Figure 7.22). During this shoot Jeff and Martin set up a further iChat screen share so that Martin could observe what Jeff was shooting and comment on the angle and lighting used to create this photo (see Figure 7.23).



Figure 7.22 Here you can see Jeff photographing the phrenology head at his studio in Chicago. Jeff shot the head tethered to his P 65+ back on a Phase One 6 x 4.5 camera.

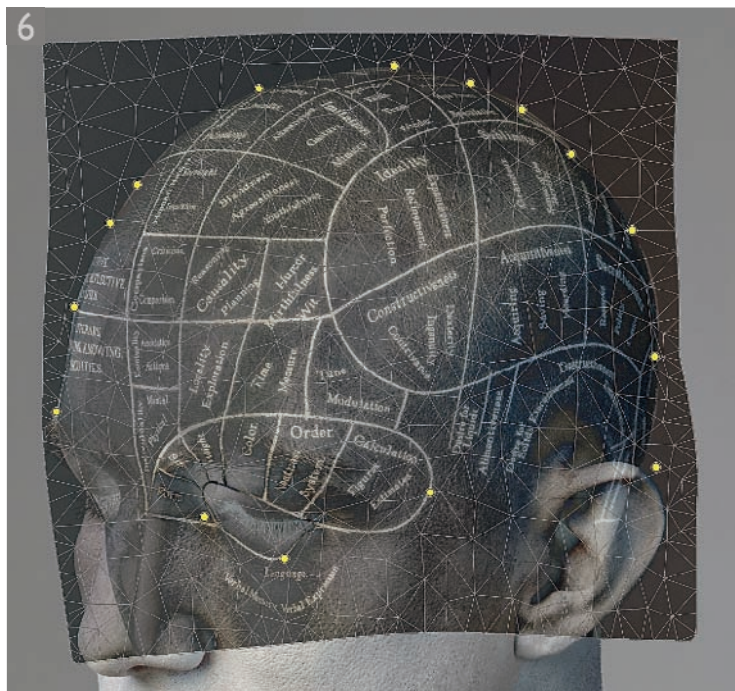
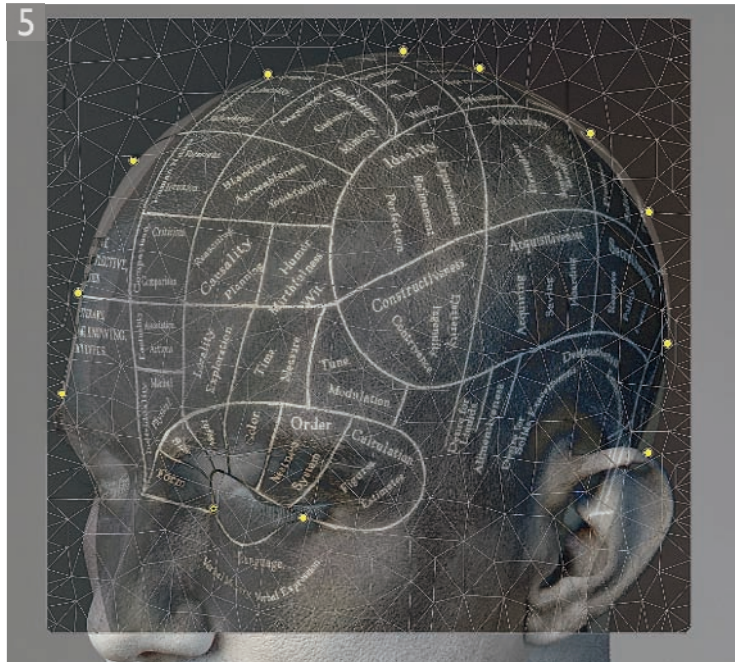


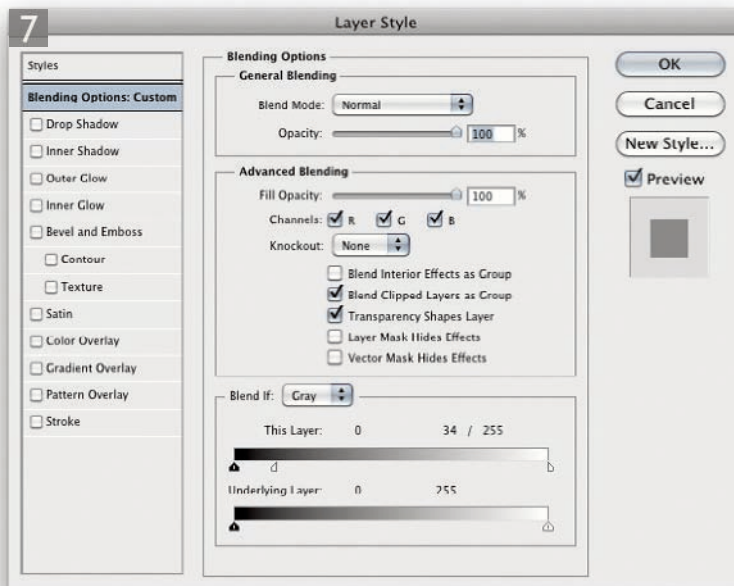
Figure 7.23 Here you can see Jeff's computer screen being shared with Martin in London. The head is shown on the left in Capture One software. The shot of Daniel is in Lightroom on the right.



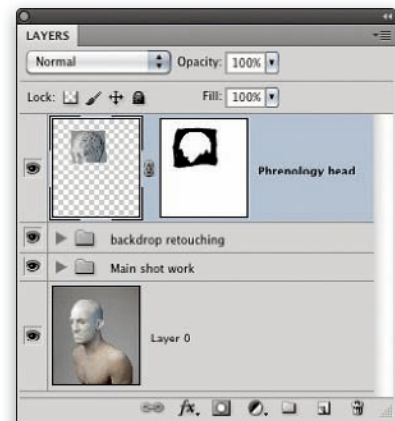
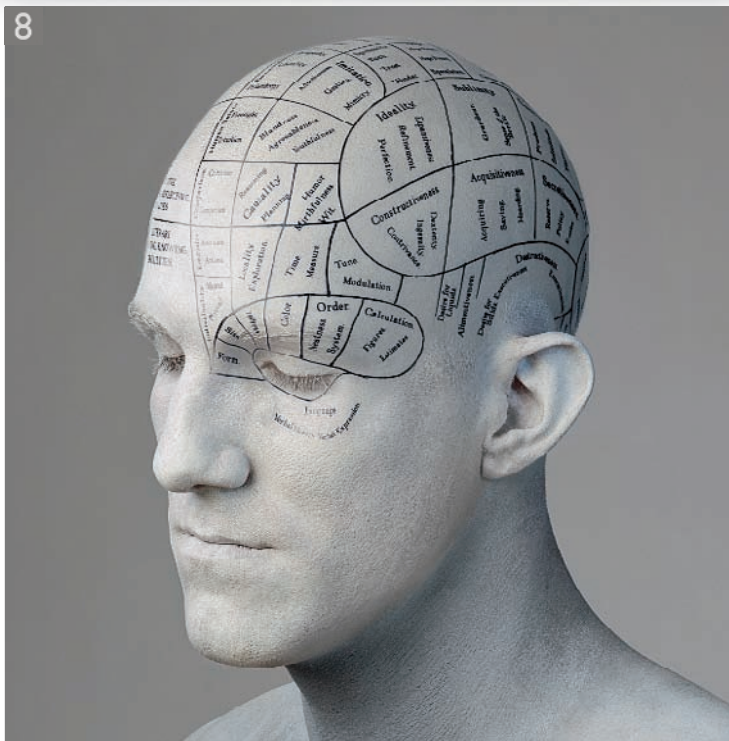
5 Now came the tricky bit of getting the phrenology head image to align with the photo of Daniel. To start with, Martin placed the phrenology head shot as a new layer and scaled it roughly to the same size as the model's head. This layer was then set to the Difference blend mode at 80%, which allowed Martin to see more clearly where this new image layer matched the outline of the layers below. Martin then went to the Edit menu and chose Puppet Warp. This added the mesh you can see here and Martin set about adding pins to the outline of the head.

6 Once a number of pins had been added, Martin was able to click and drag individual pins to fine-tune the shape of the phrenology head layer so that it matched as close as possible the layers in the master image. While the new Puppet Warp is quite powerful, this was admittedly quite a tricky step to carry out, as the Puppet Warp processing has a tendency to be quite processor-intensive. Once Martin was happy with the new puppet warped shape for the layer, he clicked **Enter** to apply the warp.

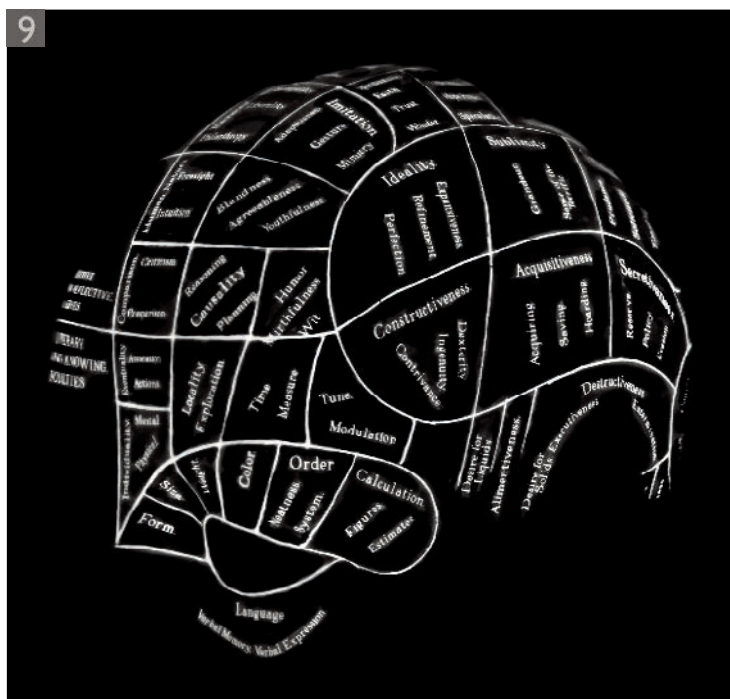
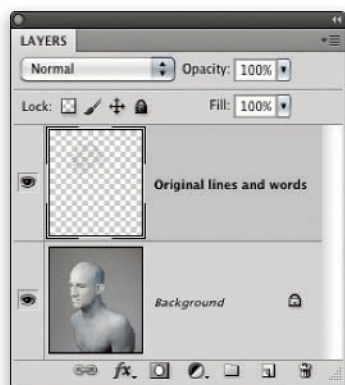




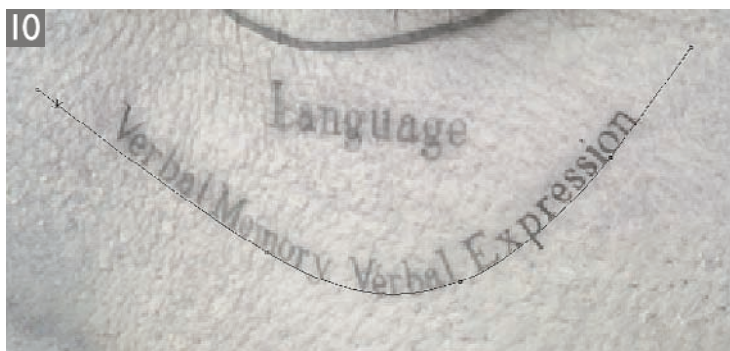
7 Martin then reset the phrenology head layer to the Normal blend mode at 100% Opacity and double-clicked the layer to open the Layer Style dialog shown. Here, he adjusted the This Layer Blend If sliders as shown on the left.



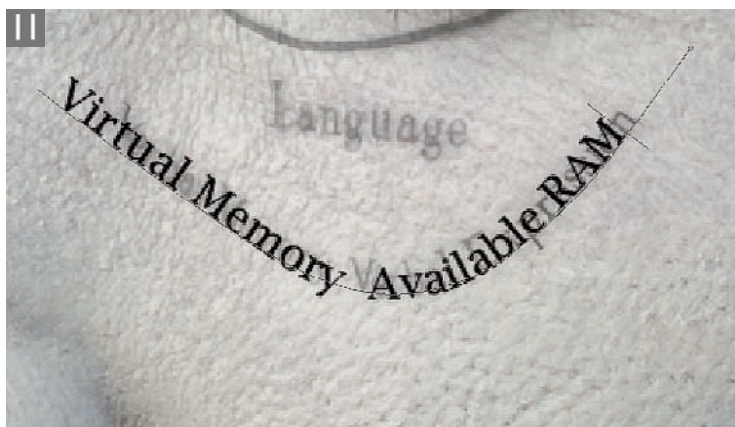
8 The edit adjustment described in Step 7 had the effect of fading out the highlight areas in the phrenology head layer and made the lettering appear to be merged with the photo of Daniel. At this stage the blend between these two images was beginning to work well. Originally, we had, at this stage, intended to make use of this result to draw pen paths that matched the outline of the lines seen here. In the end, we decided to make use of the real lines since they looked more interesting.



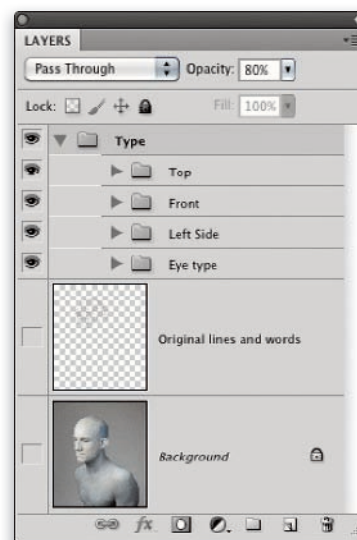
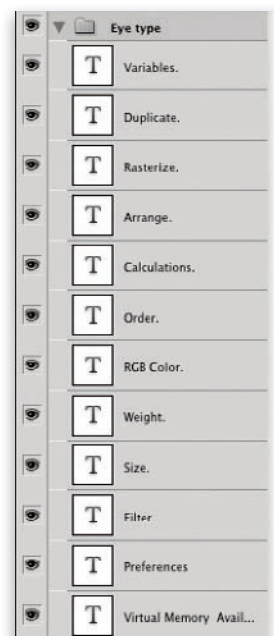
9 Martin created a new alpha channel based on the image view seen in Step 8 and edited the channel to create a high contrast mask. Then, after loading the channel shown above, he created a new layer and filled the selection with black. At this point, Martin handed over the file to Jeff for the addition of the new text and additional digital imaging.



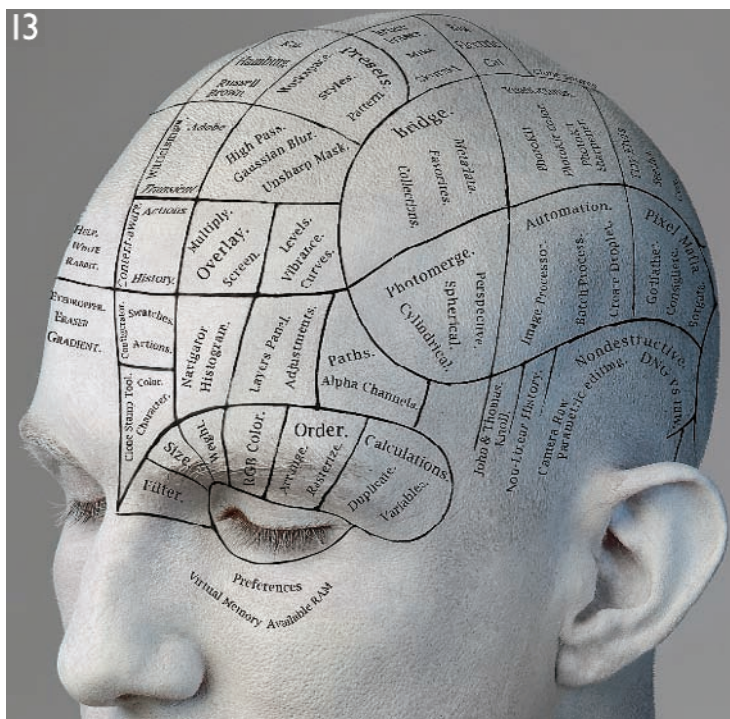
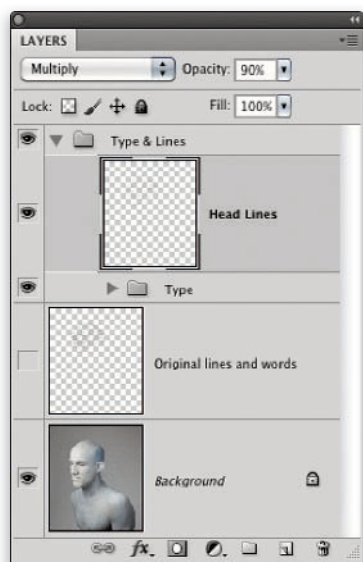
10 Martin, David Willett and Jeff had an email exchange regarding which font would match the original in look, feel and weight while retaining readability. David suggested Lucida Bright, which was one of the extended family of Lucida typefaces developed by Charles Bigelow and Kris Holmes, and first used in *Scientific American* magazine. Jeff decided to place the text using text along a path. As you can see above, he had already drawn a path along the same arc as the original words on the head.



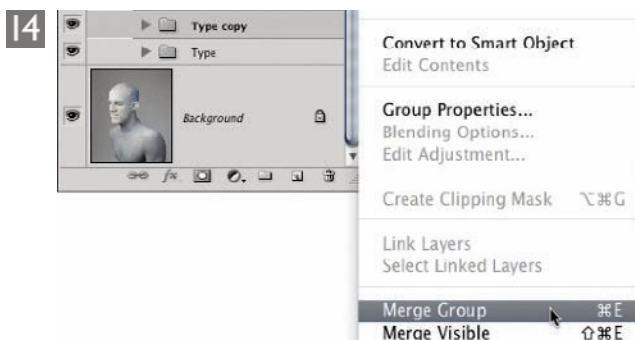
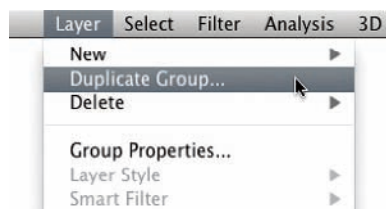
11 As Jeff typed the words, they appeared along the path and using the type along the path allowed for very accurate placement. Jeff was also able to modify the path using the direct selection tool in Photoshop's tool bar. To keep all of the words and text layers organized, Jeff placed the individual text areas of the head in layer groups. On the right you can see the first layer group of words that were all located around the eye.



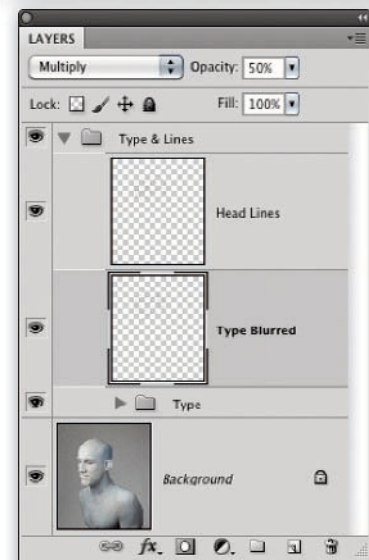
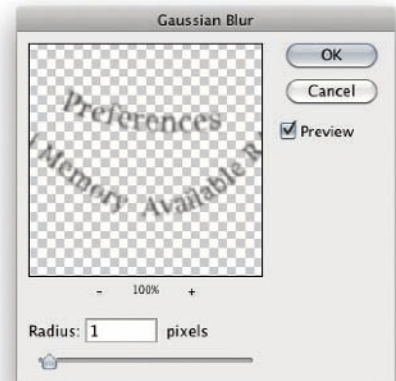
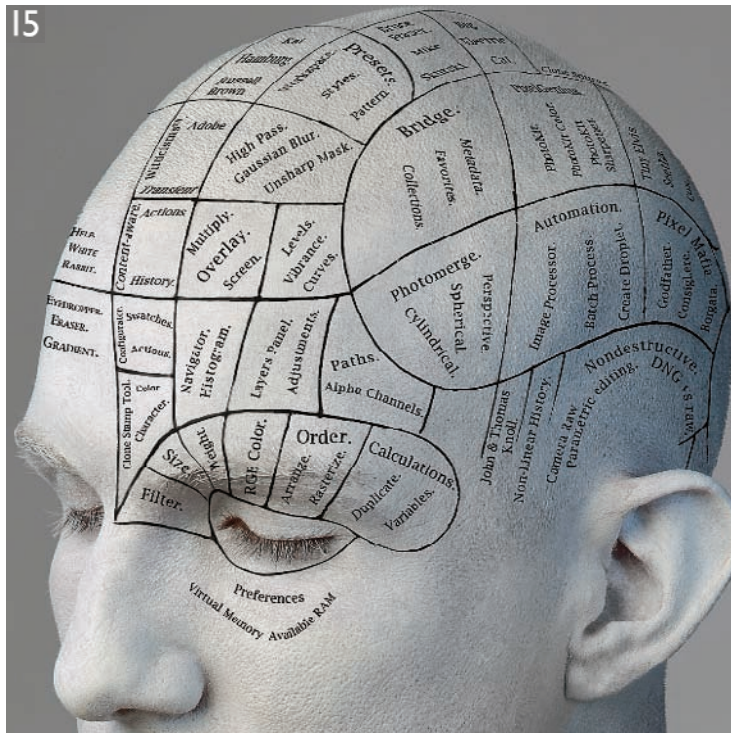
12 As you can see above, Jeff placed a lot of words – a total of 89 layers. All the text remained editable so Jeff and Martin could collaborate on which words were used where. Some of the words are features or tools and others are names. The common thread throughout was Photoshop.



13 After the new words had all been placed, Jeff used a modified channel with the original words blacked out so only the lines showed to load as a selection. After he had created a new layer set to a Multiply blend, he filled the selection with black. He also created yet another layer group called Type & Lines so the treatment of these could be matched up.



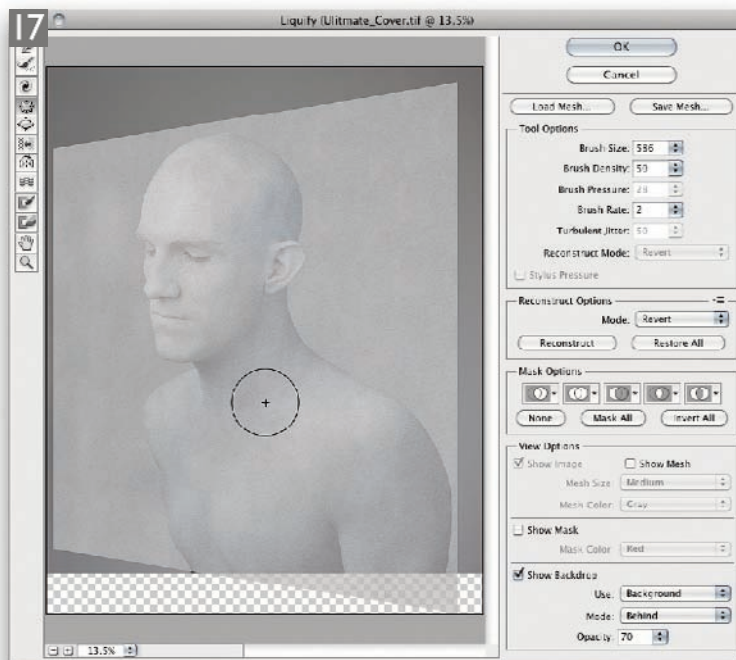
14 Jeff found a slight complication with the sharpness of the vector type when compared to the more photographic nature of the lines. To deal with this he needed to create a softened version of the type layers. He duplicated the Type layer group and used the Merge Group command from the Layers panel fly-out menu.



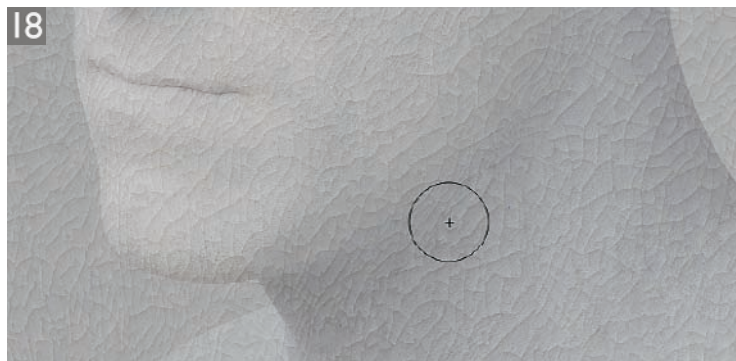
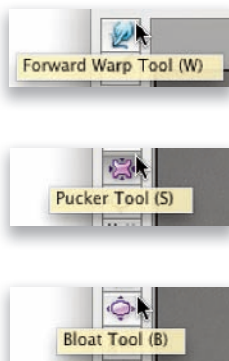
15 Jeff used a Filter ⇒ Blur ⇒ Gaussian Blur filter radius of 1 pixel to add a touch of softness to the text. The Type Blurred layer was changed to a Multiply blend using a 50% Opacity to reduce the strength of the effect. Adding the blur also had the effect of improving the readability of the text.



16 Jeff wanted to add a bit of texture to Daniel's white skin to make it look more like the craquelure that was in the glaze of the ceramic head. To sample the texture, he went back and shot the head from the side to get a large area of the head's texture. He was then able to expand on the size of the area of the texture using the new Content-Aware Fill feature. The detail image above right shows a close-up of the full texture image Jeff created.

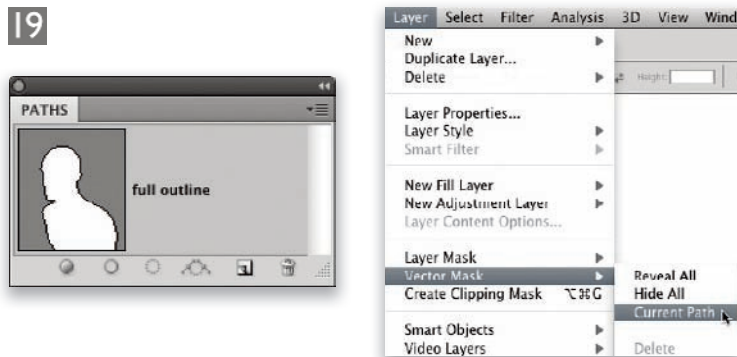


17 Jeff copied and pasted the craquelure texture as a layer and used the Free Transform command from the Edit menu to both scale the texture image down and add a perspective that was consistent with the body image. He then used Filter ⇒ Liquify to warp the texture to wrap around the body. Note, Jeff used the Show Background option with the image of Daniel (the *Background* layer) set to be visible behind the texture image, which was set to 70% Opacity.

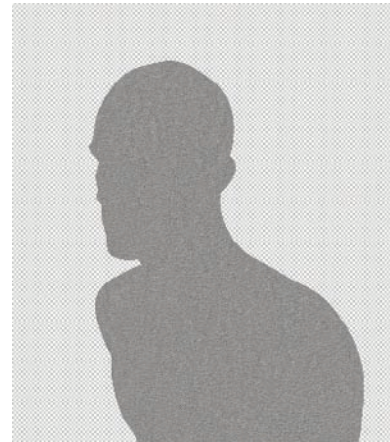


18 After zooming into the image Jeff warped the texture image to loosely follow the contour of the body. He used a combination of the forward warp, the pucker and the bloat tool. Don't laugh, that's what the engineers decided to call the various tools. Jeff then clicked **Enter** to apply the Liquify warp.

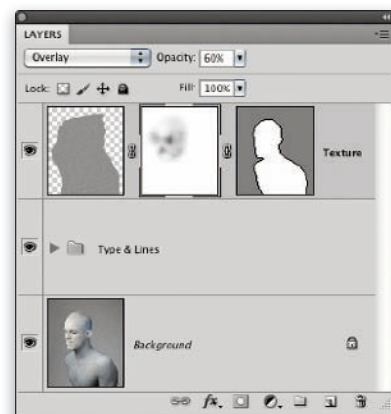
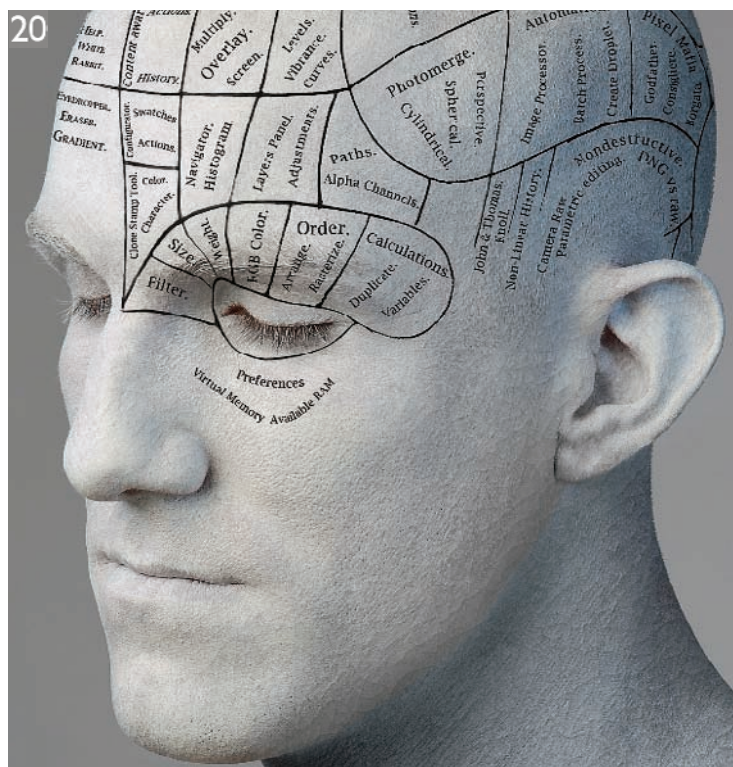
19



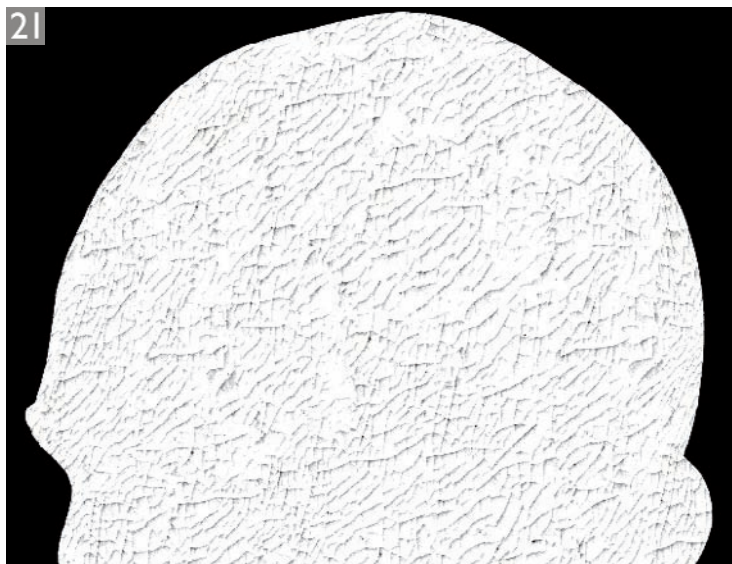
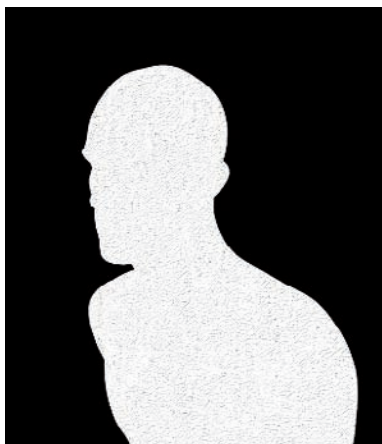
19 After the texture image had been warped with Liquify, the next step was to use a path drawn as an outline of the body to create a vector mask. This mask was used to clip the texture to the body outline only. Rather than use a regular pixel-based layer mask, Jeff chose to use a vector mask so he could also add a layer mask as the next step.



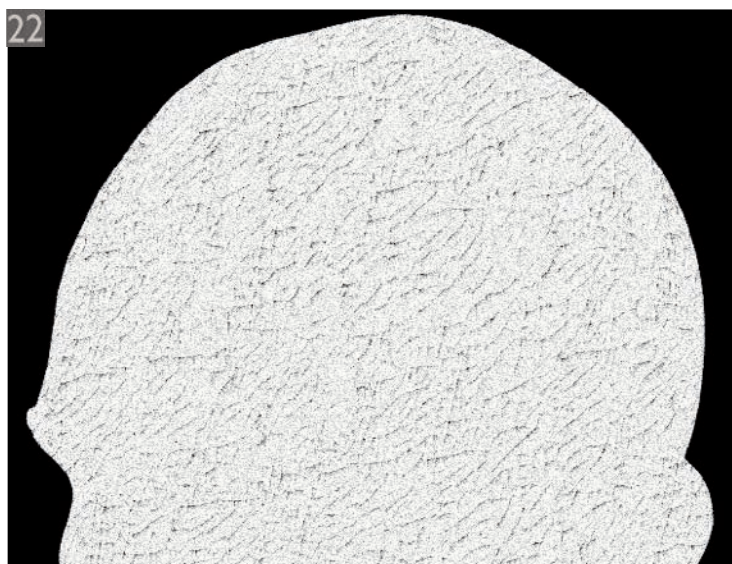
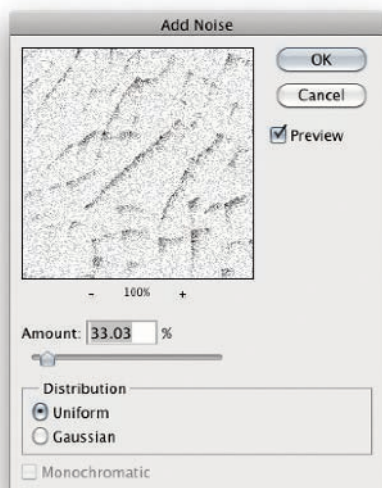
20



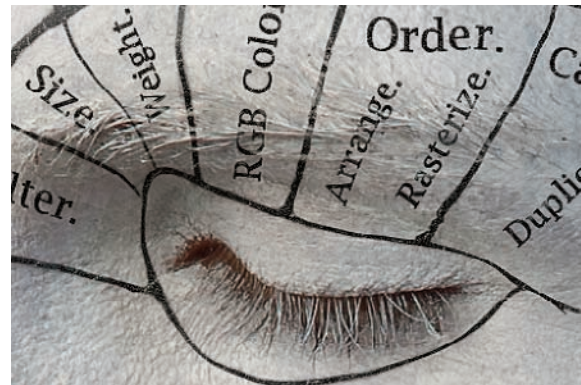
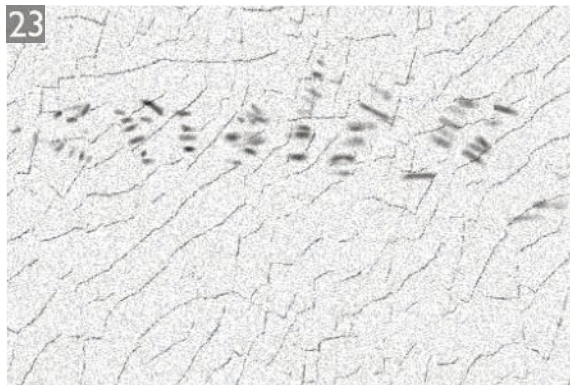
20 The vector mask took care of clipping the texture to the torso but Martin wanted Jeff to reduce the opacity of the texture around Daniel's face. So, Jeff lightly painted black into the layer mask around the eyes, the cheeks and the lips to reduce the opacity of the texture. At this point you might think the image was done but, alas, no. Jeff felt he needed to do additional work on the way the lines and words were layered over the face.



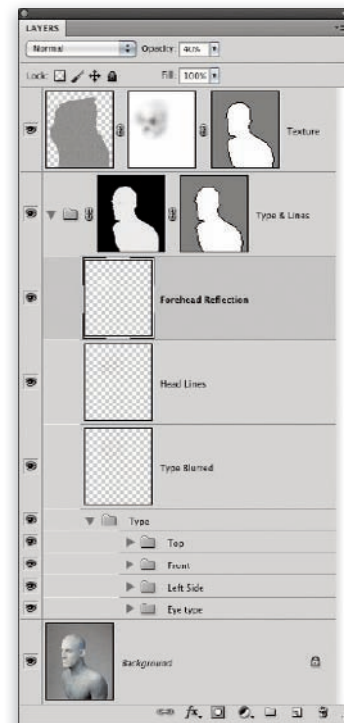
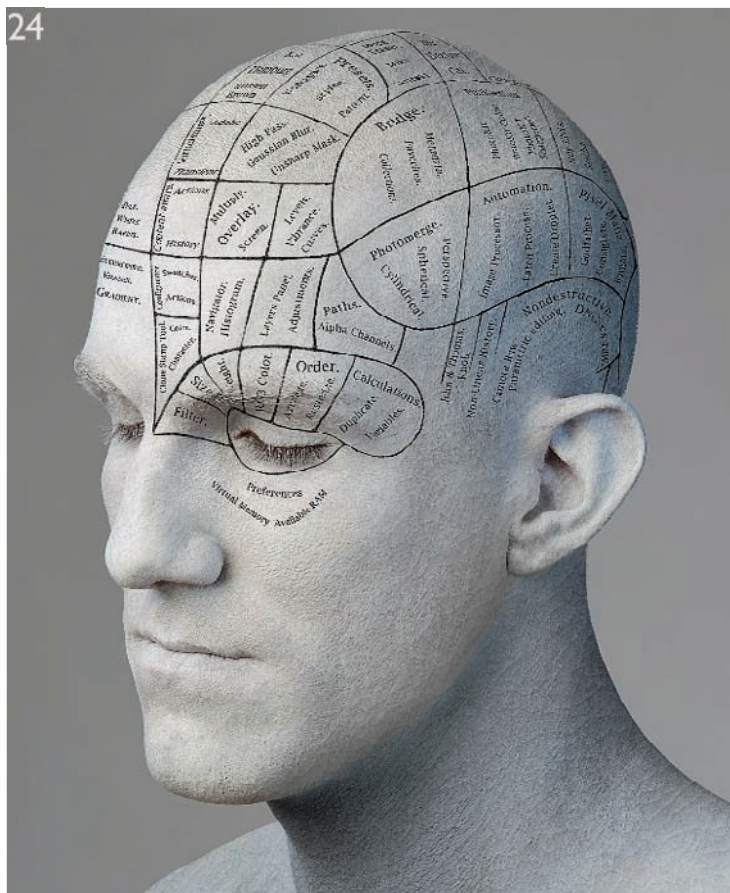
21 To apply the same craquelure to the type and the lines, Jeff copied the texture to a new channel (left) and used Image ⇒ Adjustments ⇒ Levels to substantially lighten the channel so that just the dark lines remained. Where the areas were light, all of the type and lines would show through. Where the texture was dark, the type and lines would be broken up.



22 To further modify the opacity of the type and lines, Jeff used the Filter ⇒ Noise ⇒ Add Noise filter to break up the larger areas in the channel mask. He then loaded the channel as a selection and used this selection to make a layer mask that would be applied to the Type & Lines layer group.



23 In addition to the texture and noise, Jeff painted directly on the Type & Lines layer mask to allow the underlying texture of the eyebrows to show through.



24 The very last step (we promise) was to add another layer at 40% Opacity inside the Type & Lines layer group and very gently paint a lightening effect using white. This was done to re-create the highlights that were seen on the original ceramic head.

A long-exposure photograph of a night sky, showing numerous concentric star trails. The trails are centered around a point in the sky, likely the North Star. The sky is a deep blue. In the foreground, there is a large, dark, leafy tree on the left and a smaller, lighter-colored tree on the right. Below the trees, a stone house with a tiled roof is visible. The house has several windows and a chimney. The house is illuminated by warm, yellow light, possibly from interior lights or a fire. The overall scene is a peaceful night landscape.

Photograph: Martin Evening.
Canon EOS 1Ds Mk III | Sigma 12–24 mm lens: 12 mm | 200 ISO | f5.6 @ 36 minutes



Chapter 8

Photoshop after dark

Using Photoshop to process photos taken at night

Digital photography may be great for a lot of things, but working with photos that have been shot under low light conditions presents special problems that can be resolved either by choosing the right equipment to shoot with, or using Photoshop. This chapter explores some of the ways you can help improve the quality of photos shot in low light, as well as some of the special effects you can achieve when using Photoshop.

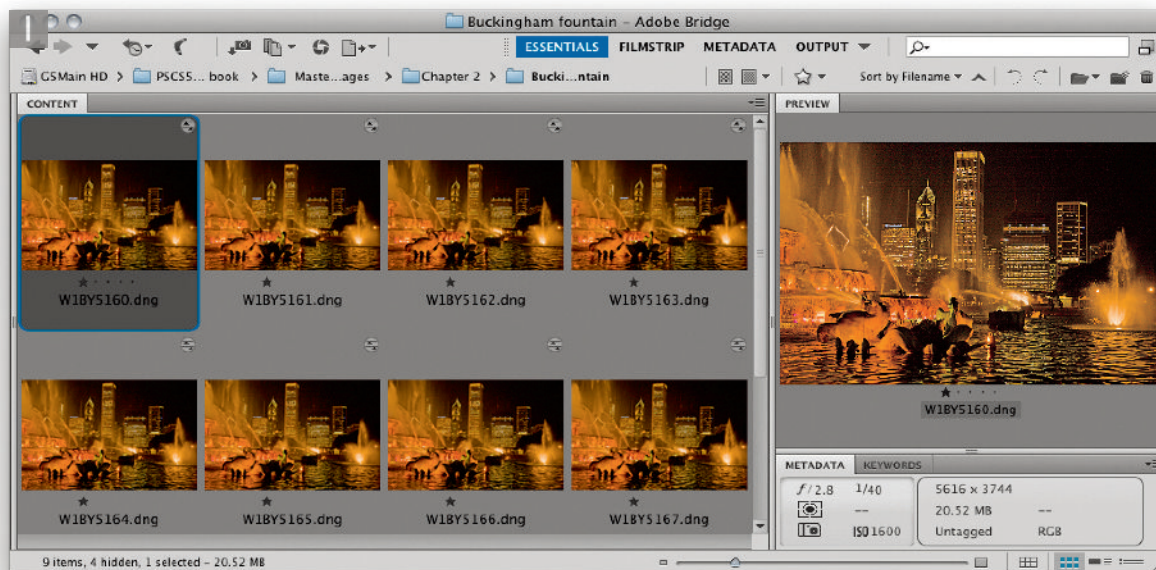
More about Stacks

Stacks is one of my favorite features for photographers. Unfortunately, it is only available as part of the extended version of Photoshop. Check out the tutorial on pages 138–141 in which we demonstrate how to remove tourists from a busy scene.

Combining images

Removing noise using multiple exposures

Here is a technique for reducing noise that makes use of the Stacks feature in Photoshop, where you can blend a series of identically shot photographs to produce a single image in which all the noise artifacts are smoothed out. This technique works very well for those situations where you are shooting pictures of still-life subjects in low light conditions but don't have access to a tripod. However, you can only use the following technique if you have the extended version of Photoshop CS3 or later. Here's how it works. Once you have aligned the photos using the auto-align method described here, the Median Stacks rendering method averages out the pixels at each point in the image. What you end up with is an image that not only will be noise-free, but may well appear smoother and sharper than the individual captures. This is because the rendering process also smooths out those shots where there was a slight amount of blur. There was also another Stacks processing technique described on pages 138–141, but this too can only work if you are using the extended version of Photoshop.



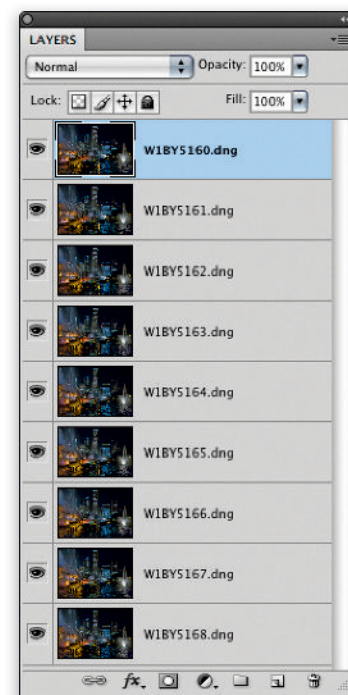
1 To begin with, I made a selection of nine photographs in Bridge that I wished to process as a stacked layer image. These pictures were all shot at night where I had simply hand-held the camera and fired off a short sequence of captures.

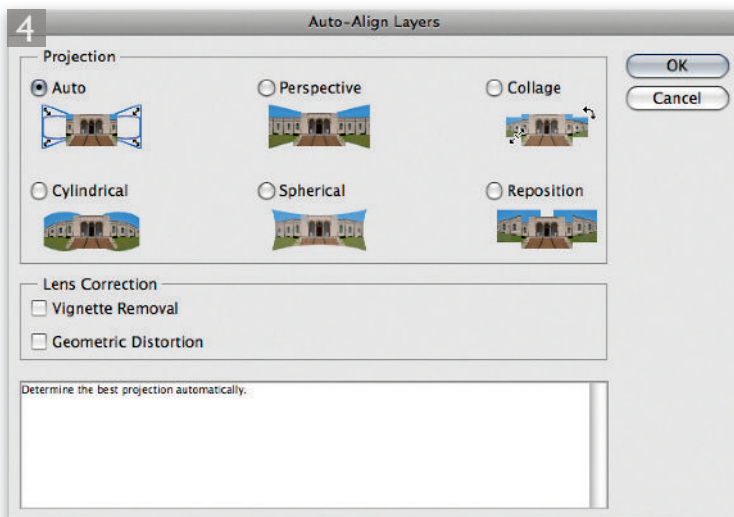
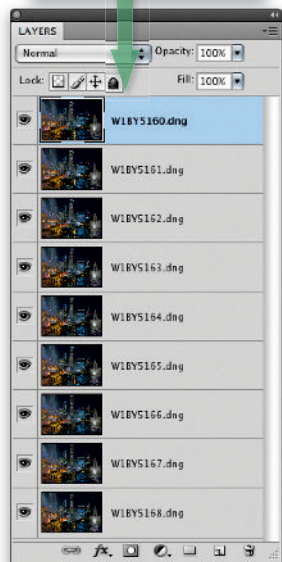
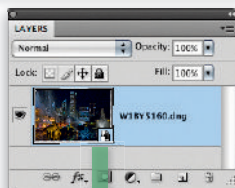


2 The first step was to open these photographs up in Camera Raw (using **⌘ R** **ctrl R**). I adjusted the White Balance plus other basic panel adjustments and synchronized these settings with the other selected photos by choosing Select All in the Camera Raw dialog, before clicking on the Synchronize... button. I then clicked the Done button to close the Camera Raw dialog and apply the settings.



3 I then went to the Tools menu in Bridge and chose Photoshop ⇒ Load files into Photoshop Layers... This opened the selected photos in Photoshop and added them as layers to a single image document. How the images were opened would depend on the workflow settings I had set in Step 2 (circled). In this instance the photographs were all processed at their native resolution using ProPhoto RGB at 16-bits per channel.



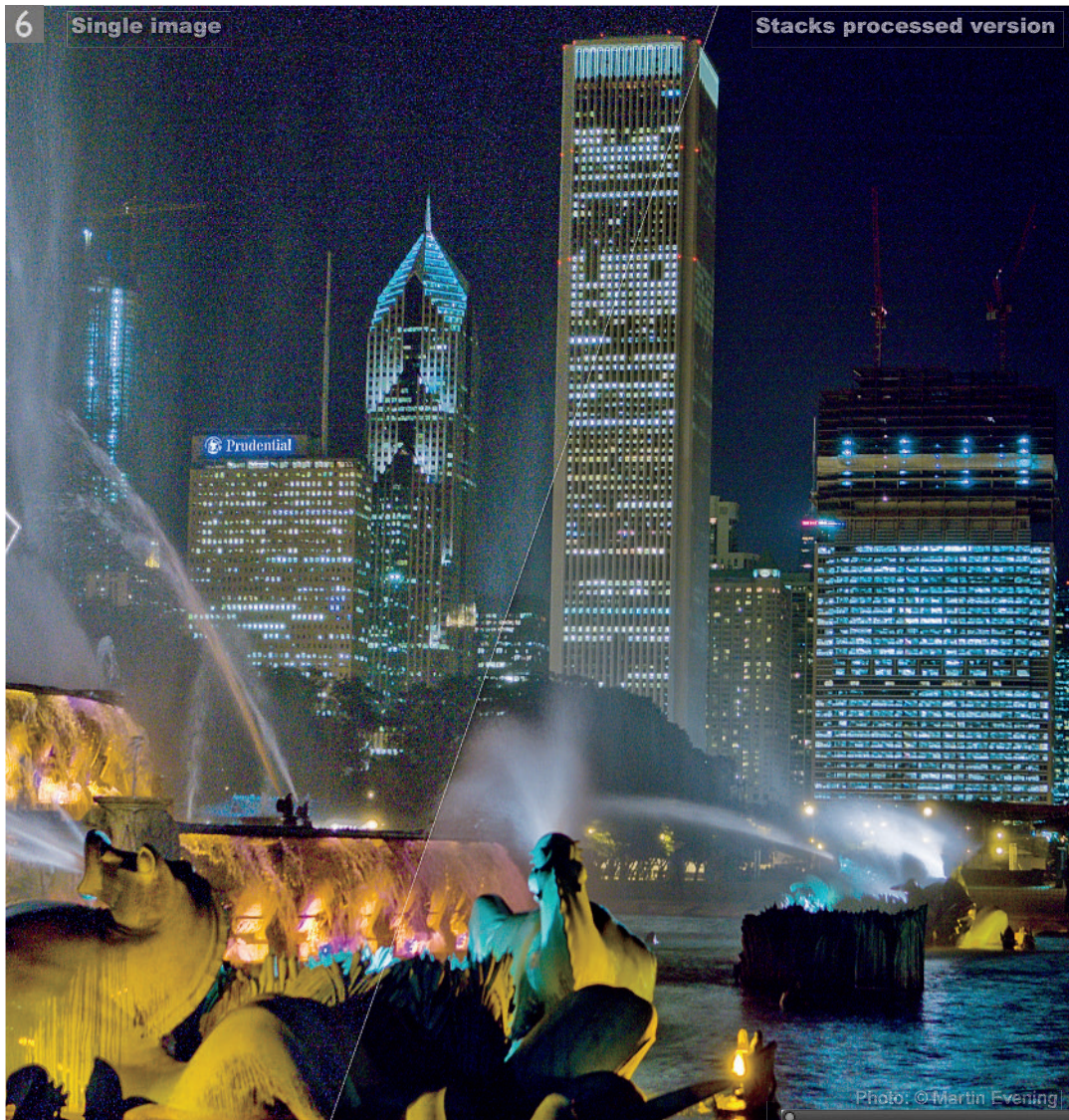


4 Since the photographs had all been captured using the camera hand-held, it was important to make sure that the layers were aligned correctly. I selected all the layers in the Layers panel, went to the Edit menu and chose Auto-Align Layers... This opened the dialog shown here, where I selected the Auto option and clicked OK.

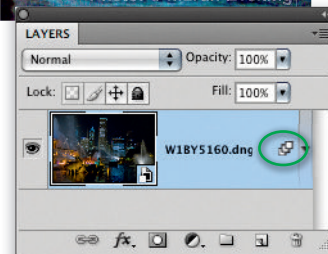


5 Here you can see the auto-aligned image. I now needed to go to the Layer menu and choose Smart Objects ⇒ Convert to Smart Object. This created the single Smart Object layer you can see here in the Layers panel on the left, but if I were to double-click the layer thumbnail I would see all the original layers that the Smart Object was comprised of.

I then went to the Layer menu again and chose Smart Objects ⇒ Stack Mode ⇒ Median. If you try this out for yourself, you may find the Stacks rendering will take a while to complete. How long it takes to apply the processing will depend, of course, on the size and number of layers, plus the bit depth of the images.



6 Once the processing was complete, you will notice how the Smart Object layer had a Stacks icon (circled) indicating that the Smart Object had been rendered using the Stacks feature. Here is a close-up view that shows a single exposure on the left and the stacks rendered version on the right where the nine separate exposures were merged to produce a smoother, noise-free image. The Median rendering was used here because it analyzed the pixel values from the lowest to the highest that occurred at any one point and picked the middle value, thereby eliminating nearly all of the noisy pixels that were present on each of the separate layers.

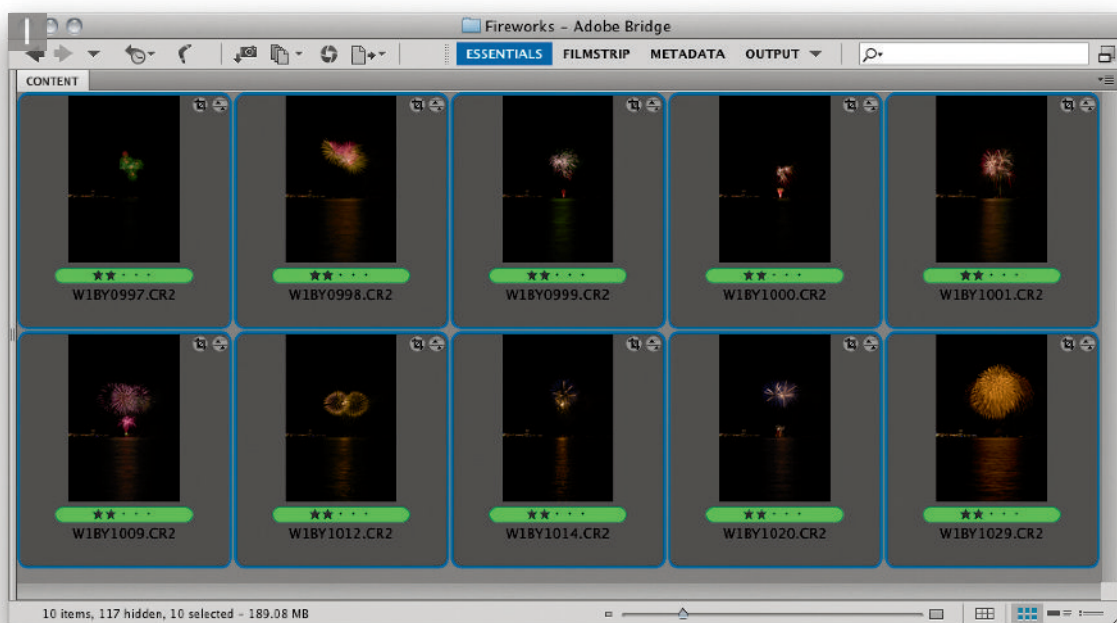


For non-extended users

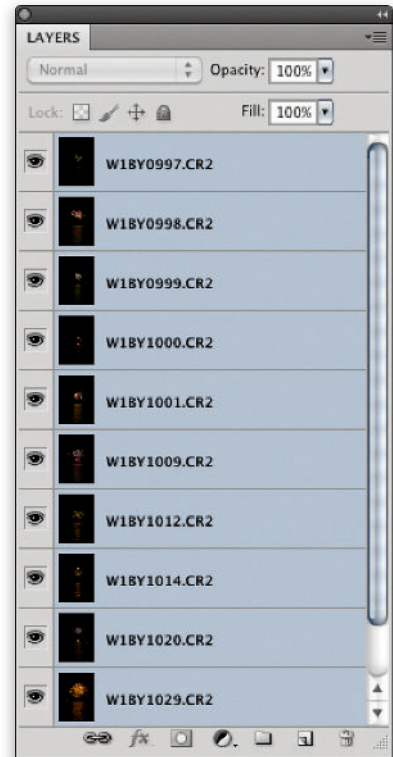
As with the tourist removal and layer stack noise removal techniques, this is another Photoshop technique that is only available to customers who have the extended version of Photoshop CS3 or later. However, if you don't have the extended version you can reproduce a Maximum stacks rendering effect by manually setting each layer to the Lighten blend mode.

Combining photographs of fireworks

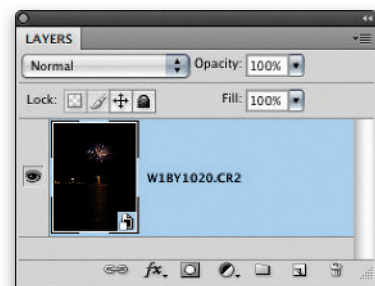
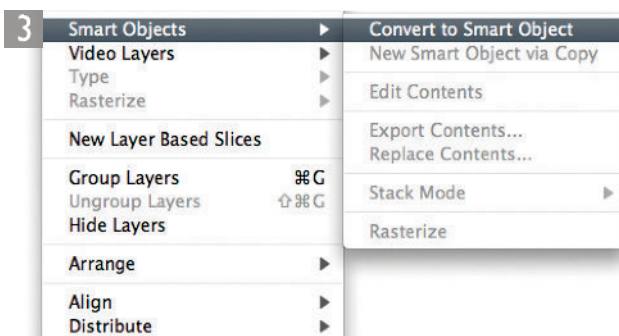
There are a number of traditional photographic shooting techniques that rely on the use of multiple exposures to produce a single blended exposure image. For example, a lot of still-life studio work is created via multiple exposures and architectural photographers may use such techniques to blend one shot of a building at dusk and another taken at night when the lights are all switched on in the building. In most cases you can successfully blend photos using the Normal or Screen blending modes. However, there are some assignments where you may like to try using the method described here, in which I used the Maximum stacks blend mode to add together 10 separate exposures of a firework display, but without losing the contrast and definition of the original single exposure shots. The Maximum stacks blend mode happened to work well when blending this particular series of images, but you may also wish to try the Range blend mode, which preserves slightly more detail in the extreme highlights.



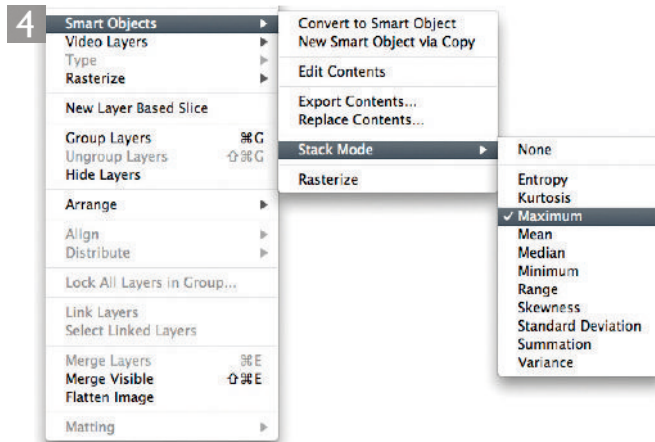
1 This Bridge window view shows an edited selection of photos that I wished to blend together to create a single, merged firework photograph. First I selected all of the images displayed here, went to the Tools menu and chose Photoshop ⇨ Load Files into Photoshop Layers...



2 Step 1 created a single image document, in which all the selected photographs were all placed as individual layers in a layer stack. Here, we can see the topmost layer visible. In this instance there was no need to align these layers as they had all been shot using a tripod. What I needed to do now was to convert this layer stack into a Smart Object. To do this, I first used **⌘ A** **ctrl alt A** to select all of the layers.



3 I then went to the Layer menu and chose Smart Objects ⇒ Convert to Smart Object. This step created a single Smart Object layer.



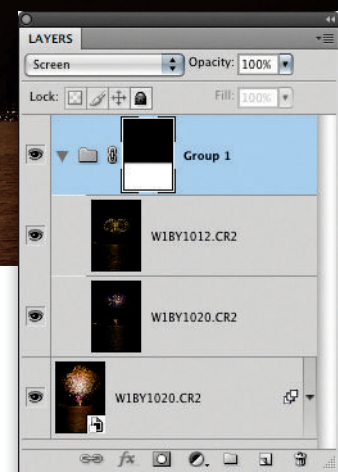
4 Now that I had converted the layered image to a smart object, I went to the Layer menu again and chose Smart Objects ⇒ Stack Mode ⇒ Maximum.



5 Here is the initial result that was produced using the Maximum stacks blend mode. As you can see, this blend method produced a merged composite image.



6 I thought that the water in the previous step looked a little dark, so I selected a couple more of the original firework shot layers and placed these inside a layer group above the Smart Object layer. I blended the top layer with the one below using the Screen blend mode. I then also set the layer group blend mode to Screen mode. This step lightened and added more detail to the reflections in the water, but didn't look so good over the sky area. To address this I added a pixel layer mask to the layer group and applied a black to white gradient which hid the top half of the layer group.



Photographing star trails

Star trail photographs are photographs taken of the night sky that record the rotation of the earth around its axis relative to the sky. To do this the camera must be firmly fixed on a tripod, pointing up at the sky and shot using a long time exposure. However, this is one of those techniques where it is actually more difficult to successfully shoot a subject like this digitally compared to shooting film. Let's begin by looking at the general problems associated with shooting star trail photos.

To start with you need to find a location that offers a good view of the night sky and is remote enough to avoid the effects of light pollution. If you live in a town or city you will rarely get the chance to view the night sky free of the light pollution that obscures the fainter stars and the Milky Way. For a city person like me, it is only when venturing out to the remote countryside that I have a chance to see the night sky in all its glory. You also need to make sure that the area of the sky you are photographing doesn't include a flight path, or the passage of the moon. Next, you need to choose an evening where there is likely to be a perfectly clear sky and you will ideally want to shoot in dry atmospheric conditions. If the air is moist, there is a good chance that the camera lens may get covered in condensation. Over the last few years, I have tried at various times to shoot star trail images, but it has usually only been possible for me to do so when staying somewhere that's remote enough and where the atmospheric conditions have been just right. Of course, I have also needed to find locations to shoot from that have included suitably interesting foreground elements. On a recent holiday trip to Mallorca I made the most of the remote villa location where we were staying to create the photo that's shown in the following steps.

Now you'll often hear people like me say how digital is better and easier to work with than film. But for this type of photography, digital presents a unique set of problems and it is in some ways more tricky to photograph star trails digitally than when shooting film. So here are a number of tips to bear in mind when shooting a star trail image at night using a digital camera. To start with you will need to capture a total exposure time of at least half an hour, or maybe as long as a couple of hours in order to record a decent star trail image. When I began shooting star trails I tried doing this using a single exposure. The problem with this approach was that

when the shutter was left open for long periods of time, the sensor tended to generate a lot of random background noise which would accumulate throughout the exposure period and be most apparent in the darker areas of the image. When shooting film, noise would only be a problem in terms of film grain and if you were using, say, a 100 ISO or 200 ISO film emulsion, you could capture a perfectly smooth star trail image at any exposure duration. With digital, the random noise generation can be a real problem. In the early days of digital cameras even an exposure time of just a few seconds was enough to tip the balance and cause a serious deterioration in the quality of the image capture. These days it is possible to record much longer time exposures before seeing any adverse affects. When it comes to shooting really long exposures though, the best approach with current digital camera technology is to limit the maximum exposure time to around 2 minutes per exposure and then combine a sequence of exposures that have been captured one after another. I demonstrate how to do this in the tutorial that is coming up. Essentially, you can usually use the software that comes with the camera to shoot in tethered mode and configure the software to shoot a set number of shots in a continuous sequence. Or you may find there is an option in the camera menu itself that allows you to do this. Many digital cameras have an optimum ISO setting that is slightly faster than the lowest ISO speed setting. The pictures you see here were shot in raw mode using the Canon EOS 1Ds MkIII camera set to 200 ISO and with a lens aperture of f/5.6.

The other problem to watch out for is battery life. For as long as the shutter is open, the camera battery is going to be used to power the camera's sensor. CCD sensors can consume a lot of power, whereas the modern CMOS sensors are much more power efficient since they draw less charge. If you are about to shoot a sequence of long exposures, you will need to make sure you are using a fully charged battery. Some photographers overcome this limitation by using a power supply lead connected to an external power source such as a domestic power supply or a car battery. If shooting, as I did here, with the camera tethered to a laptop computer, it also important to make sure the computer itself has a sufficient amount of battery charge to last throughout the total series of time exposures.

For non-extended users

The technique is described over the following pages is another one of those that is only available to customers who have the extended version of Photoshop CS3 or later. However, as with the fireworks composite described at the beginning of this chapter, you can reproduce a Maximum Stacks rendering effect by manually setting each layer to the Lighten blend mode. The main reasons why I advocate using the Stacks rendering method here are a) it is quicker and b) you can also try using the Range Stacks rendering method which will produce a slightly different result (that can't be simulated using layer blending modes). The Range Stacks rendering produces a more contrasty and darker effect. It didn't work so well with the image example I used here, but it may be useful for other types of star trail images, especially if the cumulative exposures are looking too light.

Lighting the foreground

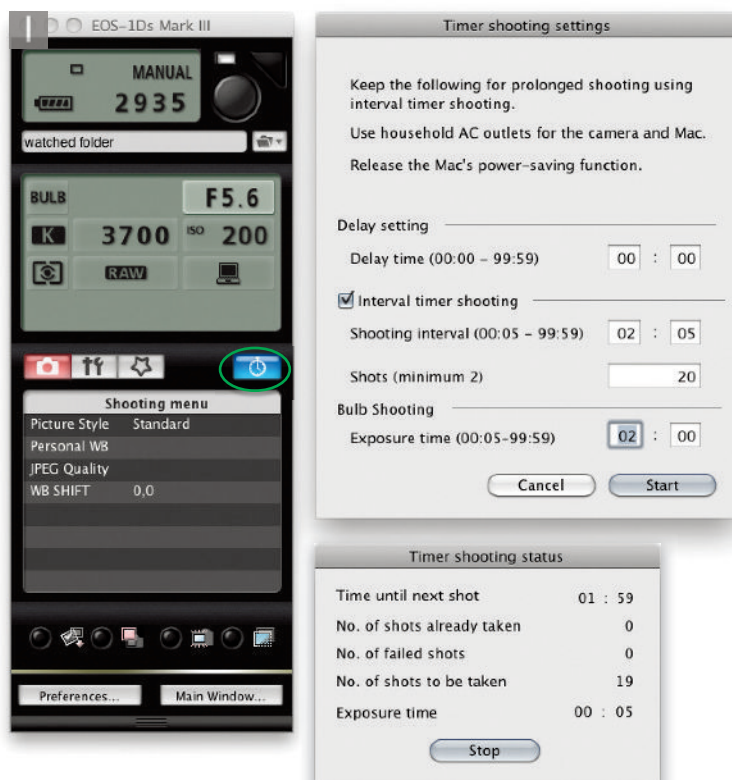
It is a good idea to frame your picture using foreground features such as buildings or trees, but you don't want these to appear in silhouette and they will therefore need to be lit.

As mentioned in the main text, you can use a torch light or a flashgun to do this. Since the technique shown here relies on the use of a sequence of photographs being taken I strongly suggest you create these additional shots either at the very beginning or at the end. This will leave you with the option to experiment and select which foreground exposures work best.

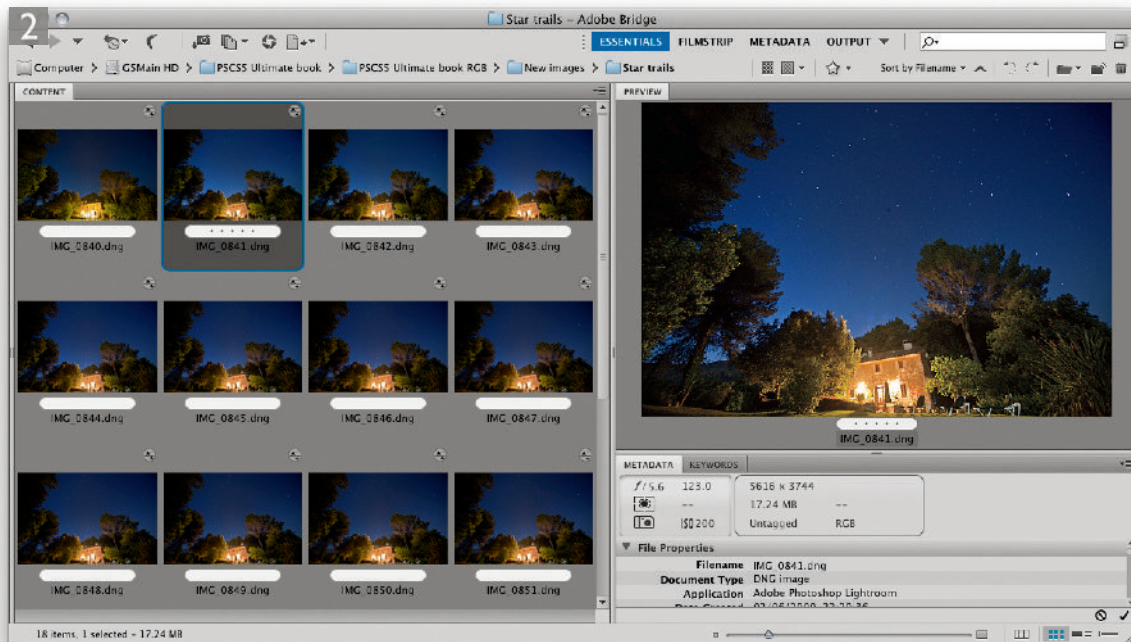


Figure 8.1 This shows the typical setup I use to shoot star trail photographs, where the camera is controlled via a laptop computer running the tethered capture software that comes with the camera.

To shoot the night-time sky, choose a location during daylight hours, set your camera up on a sturdy tripod and compose the scene so that it includes something in the foreground. You don't want to shoot just the sky on its own, so look for interesting trees or buildings to include in the picture. Make a note of the camera field of view so that you can plan in advance how to expose the night scene later when it is dark, using either a torch light or a portable flashgun (see sidebar).



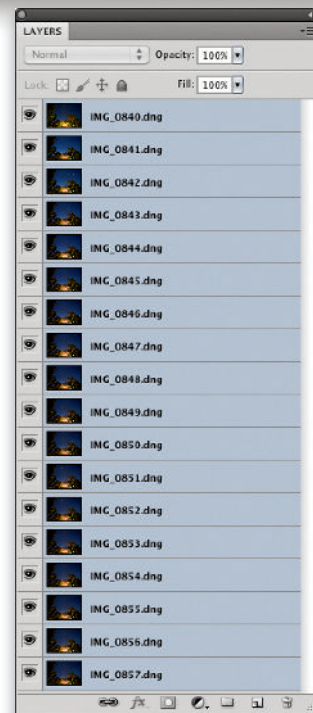
1 To begin with, I set up the camera on a tripod during daylight hours (see Figure 8.1), selecting the ideal camera angle viewpoint to shoot from. In this instance, because I was shooting with a Canon EOS camera, I configured the EOS Utility software to shoot a sequence of photographs. Here, I adjusted the camera settings and made sure the shooting mode was set to Bulb. I then clicked on the Timer shooting button to open the dialog shown top right, where I set the Exposure time to 2 minutes (in which case, the Shooting Interval has to be at least 2 minutes 5 seconds) and configured the dialog to shoot 20 exposures. When I then clicked the Start button, the Timer Shooting Status dialog appeared to indicate how the shoot sequence was progressing.

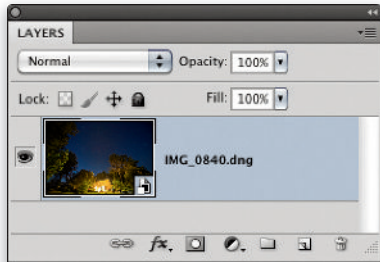


2 Once I had finished shooting I was able to open the photos in Bridge and prepare to edit them in Photoshop. What I did here was to make a selection of all the shots and choose Tools ⇒ Photoshop ⇒ Load Files into Photoshop Layers...



3 At this stage I had an opened image in Photoshop that consisted of 18 stacked layers. I used **⌘⇧A** **ctrl alt A** to select all the layers and then went to the Layer menu and selected Smart Objects ⇒ Convert to Smart Object.





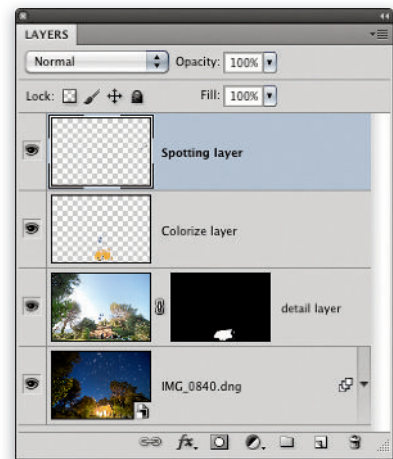
4 Once I had created the Smart Object layer I went to the Layer ⇒ Smart Objects ⇒ Stack Mode menu and selected the Maximum rendering method. In a stroke this processed all the images to reveal the cumulative star trail image seen here. The result looked pretty good and when applying this step you should end up with a decent finished image. However, in hindsight I should have made allowance for the fact that the lights on the building were likely to burn out the detail on the house.



5 What I should have done was to take a briefer exposure of the scene just prior to shooting the main exposure sequence. As it happens, I did make an exposure a little earlier during daylight hours, which was just as well, since I could use this to recover some of the lost image detail. What I did was to take the photo seen here, add this as a new layer above the star trail processed image and set the layer blending mode to Darken. I then added a layer mask filled with black and carefully painted on the mask with white to repair the burnt-out areas.



6 Here you can see the finished result. There were still a few more things I needed to do to get this photograph looking perfect. First, I added an empty new layer set to Color mode and used sampled paint colors to work with the paint brush and tidy up some of the areas, such as where there were uneven colors on the building and signs of some lens flare in the lower middle portion of the sky. You know what I said earlier about avoiding overhead flight paths? This was such a good angle to shoot from and although I was pointing the camera away from the main flight path, I still ended up recording a few light trails from overhead aircraft (you should be able to see some of these in Step 4). When I shot this picture I was using Photoshop CS4 and it was particularly tricky to remove these using the healing brush. Now with Photoshop CS5 I was able to use the spot healing brush in Content-Aware mode to effortlessly remove these completely.



Preserving the pixels

This technique also teaches an important lesson about the use of the Color blend mode to blend coloring adjustment layers such as the blue curves coloring layer I applied in Step 5 on page 315. Doing this produced a cleaner histogram compared to leaving the coloring adjustment layer set to Normal blend mode.

Demo Action



The steps shown here are available as an action: CS5 Nocturnal, which is available from the DVD.

Nocturnal effect

There is a film by the French film director Francois Truffaut called *La Nuit Américaine* (known in the English-speaking world as *Night for Day*), where the title of the movie is based around the use of a photographic filter designed to make daylight footage resemble a moonlit night scene. In all my photographic career I never did manage to work out the elusive combination of filters used to pull off this trick, but I was recently inspired to see if a similar type of effect could be achieved directly in Photoshop.

In creating a simulation effect such as this, I needed to work out what exactly makes a scene look like it has been shot at night as opposed to day. There was certainly more to this than dimming down the exposure. First of all you have to take into account the way our human vision is compromised in low light conditions. Our eyes are less able to gauge colors and we therefore perceive everything as being more monochrome. We tend to think of moonlight as being blue in color, but the color temperature of moonlight is actually around 4125 K, which although slightly cooler than a tungsten halogen light is still warmer than normal daylight. The reason why we perceive moonlight to be blue is because of Purkinje's phenomenon, which describes how in low level lighting conditions red/yellow colors appear to become less luminous and green/blue colors appear to become brighter. It is these shifts in our human visual response combined with the dimmer lighting conditions that contribute to the way we perceive night-lit scenes differently compared to a daylight scene.

ProPhoto RGB editing

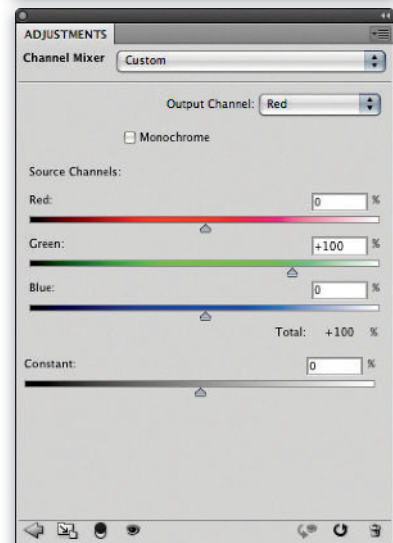
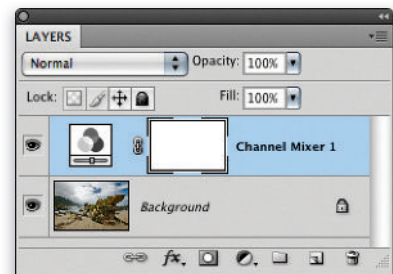
For any technique that involves using tone and color adjustments, the RGB space of the source image will always have a bearing on the final outcome. Such differences may often be so slight as to be unnoticeable, but not so when big changes are made to the image. This particular technique was devised for use with the ProPhoto RGB space, because only ProPhoto RGB was able to handle the huge color shifts applied in Step 2 before converting these into the tamer luminosity tone adjustment shown in Step 3. If you were to use sRGB or Adobe RGB, Step 2 would cause a lot of the color information to be clipped early on. You could modify the settings used here to achieve a similar result when working with smaller gamut RGB spaces, but for best results I suggest you use ProPhoto RGB throughout.

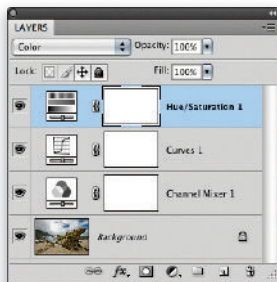
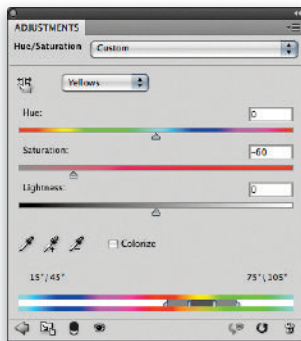
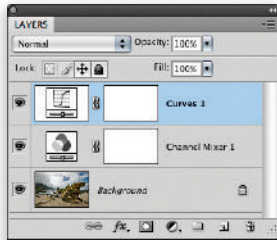
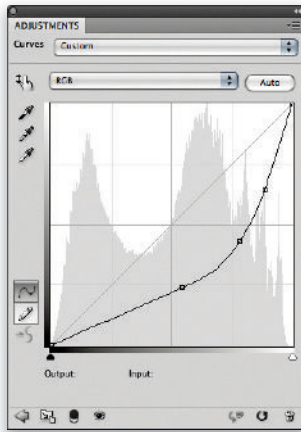


1 I started here with a normal color photograph in ProPhoto RGB and began by adding a Channel Mixer layer. Any photograph will do, but not all pictures will look convincing as a nocturnal image. Ideally, I suggest you begin with an image that is in 16-bits per channel mode since this technique involves a fair amount of pixel stretching.



2 In the Channel Mixer settings I set the channels as follows. In the Red channel I set Red to 0, Green to +100 and Blue to 0. In the Green channel I set Red to 0, Green to +200 and Blue to -100. In the Blue channel I set Red to 0, Green to 0 and Blue to 200. This combination of settings produced the false-color look seen here.





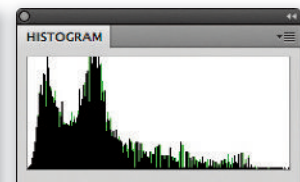
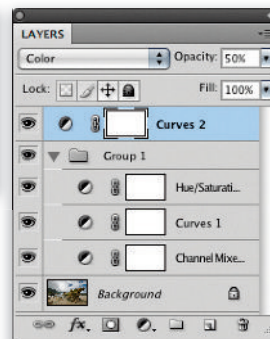
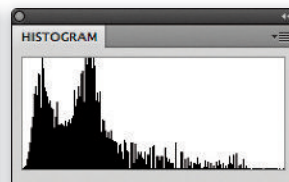
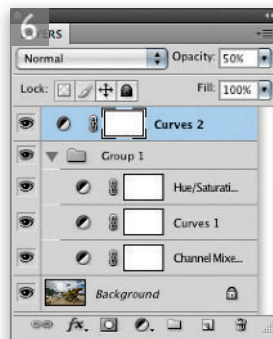
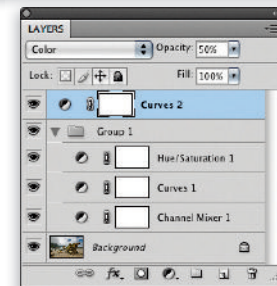
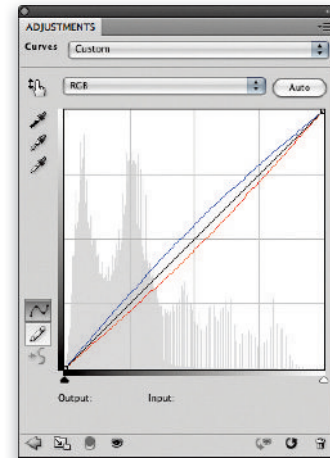
3 The Channel Mixer adjustment step was designed to boost the green luminance in the scene. The coloring effect was interesting, but not exactly the look I was after here, so I set the blend mode of the Channel Mixer layer to Luminosity. Next, I added a curves adjustment layer in Normal mode that darkened the scene to make the photograph look more night-like.



4 The next step was to knock back the yellow saturation. I added a Hue/Saturation adjustment layer, set the Yellows saturation to -60 and the layer blend mode to Color. I then held down the **Shift** key, clicked on the Channel Mixer layer to select all three adjustment layers and chose Layer \Rightarrow Group Layers (**⇧ G** **ctrl G**).



5 Finally, I added a Curves adjustment layer to the top of the layer stack (above the Layer Group) and adjusted the red and blue curves (as shown here) to create a blue/cyan cast. I set the blend mode of this layer to Color and reduced the layer opacity to 50%. The reason I did this was because it gave me the freedom to tweak the coloring effect strength. You probably won't see much difference in the appearance of the image, but you'll see why this is important in the following step.



6 A series of adjustment layers can cumulatively stretch the pixels in the base image and create spikes and gaps in the image histogram. However, there are ways that you can mitigate such losses. On the left is a layer stack in which I followed all the stages up to Step 5 and left the final Curves layer in Normal blend mode. As you can see, the 8-bits per channel image histogram is quite choppy. On the right, I set the layer blend mode to Color, overlaid the histogram from using this blend mode over the Normal mode histogram and highlighted the difference in green. Note how the Color mode histogram has fewer spikes. If you apply these steps to a photo that is in 16-bit mode, you will see even fewer spikes and gaps in the final histogram.

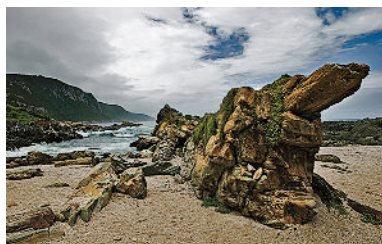
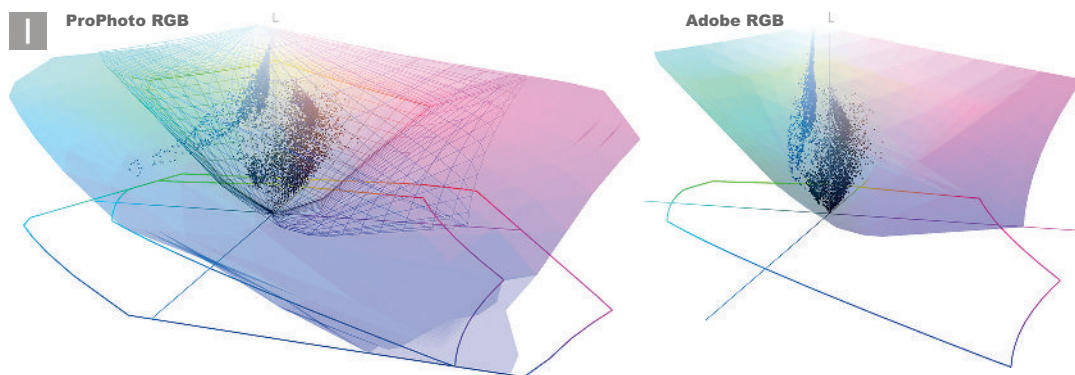
Darkening bright colors

This technique worked well with the image used here. However, for shots that contain bright colors, such as say, a bright yellow taxi or red bus, you may need to add a further adjustment to tone such colors down to make such colors appear less saturated.

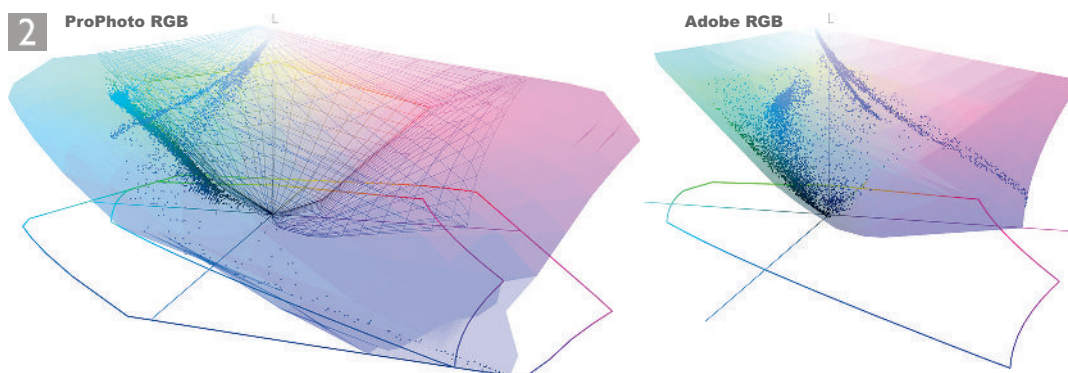
Preserving colors with ProPhoto RGB

Over the last 10 years, the advice on which is the best RGB color edit space to use has shifted. Initially, most experts suggested you use Adobe RGB, but in recent years opinion has changed and we now advocate you use the ProPhoto RGB as your edit workspace.

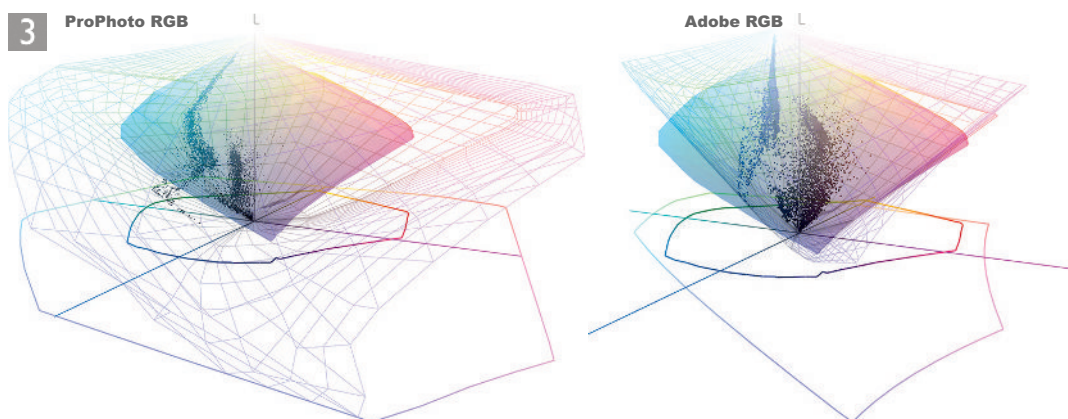
There are two main reasons for this. Firstly, many inkjet printers now have color gamuts that are typically wider than the Adobe RGB space. Therefore, by choosing ProPhoto RGB as your edit space you can make full use of the gamut of the printer, especially when it comes to reproducing shadow colors on glossy printing paper. Secondly, because ProPhoto is a wider gamut space, it is better suited for carrying out pixel calculations where the calculated pixel values may end up extending beyond the boundaries of a smaller gamut color space. Using the last tutorial image as an example, we can see how the ProPhoto RGB space offers extra headroom with which to make some big pixel shifts, whereas a smaller gamut space will simply clip the pixels that extend beyond the gamut limits.



1 These 3D diagrams allow us to compare the use of the ProPhoto RGB and Adobe RGB edit spaces. The pixels in the photograph on the left are shown here plotted to their RGB coordinate positions in each color space. You will notice that the ProPhoto RGB space does not constrain the pixels in any way and that the pixel colors in the ProPhoto RGB master image extend beyond the gamut limits of the Adobe RGB space, which is represented here (for comparison purposes) as a wireframe diagram within the ProPhoto RGB space gamut.



2 One of the early steps in the Nocturnal effect (described on page 313) involved applying an extreme Channel Mixer adjustment. This image adjustment really stretched the pixel values to the limits. It is therefore just as well that the huge color gamut of the ProPhoto RGB space was capable of containing this kind of adjustment and preserved the color and tonal relationships between all the individual pixels. If the Adobe RGB color space had been used to edit the image, the Channel Mixer adjustment would clip most of the colors because the gamut was simply not big enough to allow Photoshop to calculate such an extreme adjustment.

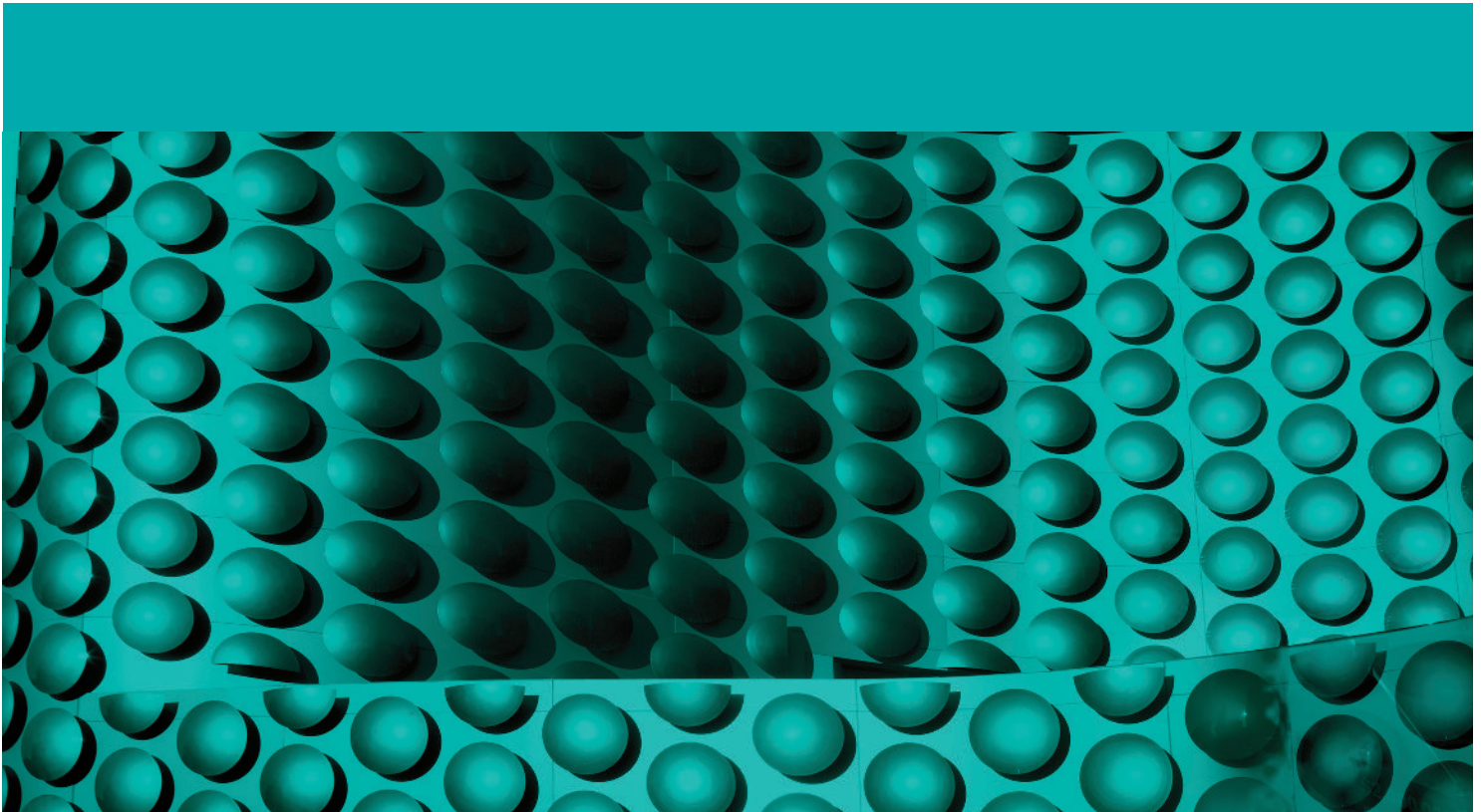


3 Although the Nocturnal effect applied an extreme color adjustment at the beginning, the pixel values were later squeezed back again to produce a more muted-color look in the finished image. You can't see the differences too clearly in these 2D representations of the 3D gamut shapes, but there was a substantial blue hue shift in the Adobe RGB edited version. What mattered most, of course, was which version would print better? For this last step I switched the color gamut profiles to wire frames and overlaid the color gamut of a glossy paper print profile as a solid shape. In the ProPhoto RGB example you will notice that although some blues are beyond the gamut of the printer, more color detail is preserved in the shadows.





Zion Park, Utah, USA. Photograph: Martin Evening.
Canon EOS 1Ds Mk III | Sigma 12-24mm lens: 13 mm | 200 ISO | f11.0 @ 1/25th - 1/400th



Chapter 9

Photomerges

Blending images together in Photoshop

As has been pointed out elsewhere in this book, working with Photoshop can often cause you to rethink the way you go about shooting certain subjects. This chapter focuses on the use of two key features in Photoshop: the Merge to HDR Pro and Photomerge. Using these tools you can use multiple captures to compress the dynamic range of the subject you are photographing, extend the camera viewpoint, or combine these techniques together to achieve both.

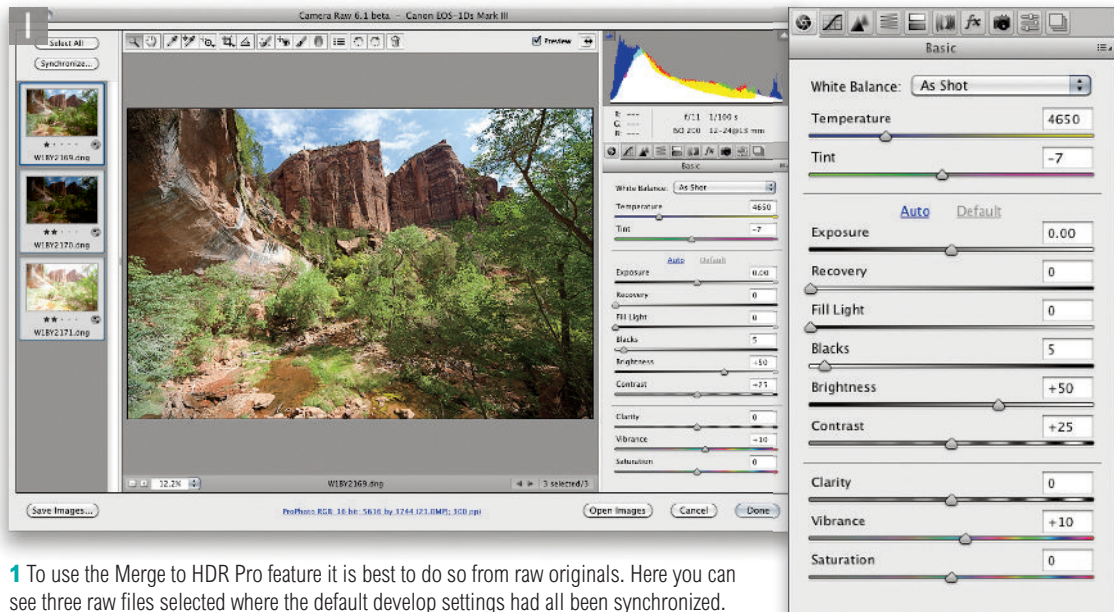
HDR toning

When you apply an HDR Toning image adjustment to a standard image, it is converted on-the-fly to 32-bits per channel, thereby allowing you to achieve a fake HDR to LDR conversion. Even though this isn't a real HDR image conversion, it does provide an interesting alternative to Shadows/Highlights image adjustments.

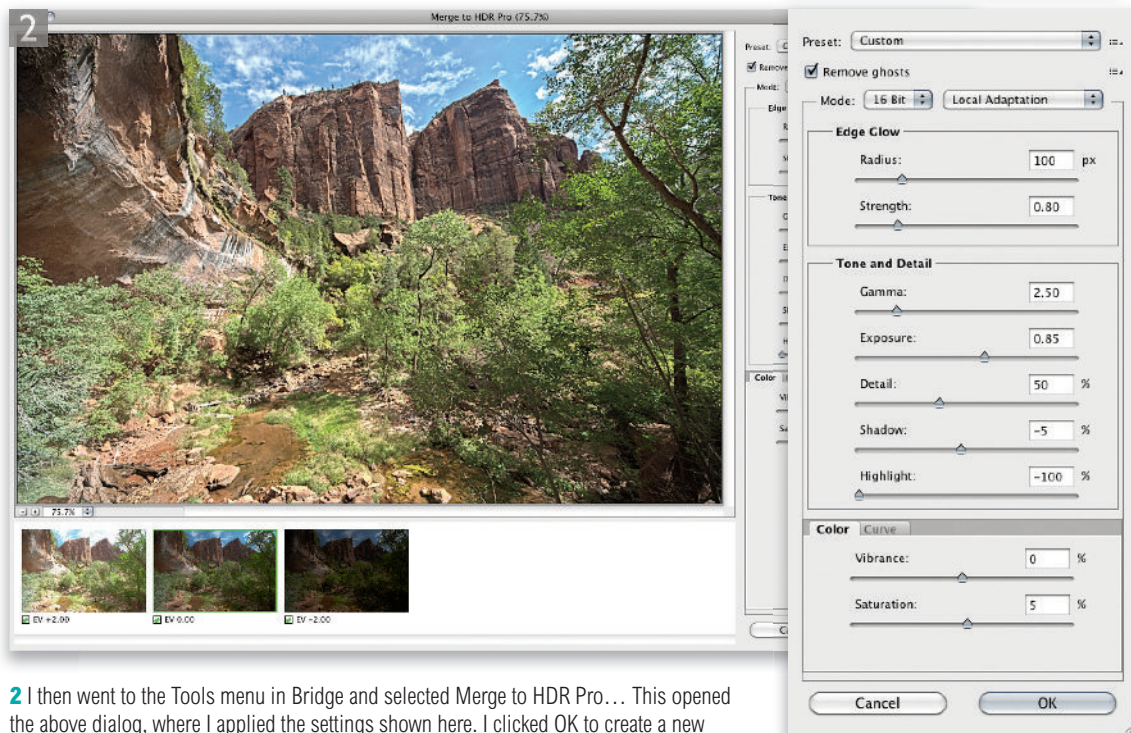
Merge to HDR Pro

The Merge to HDR Pro feature has been updated in Photoshop CS5 to provide improved merging of bracketed exposures to create merged 32-bit high dynamic range (HDR) images and better tone mapping conversions to 16-bit or 8-bit low dynamic range (LDR), incorporating better ghost removal and more extensive tone mapping controls. If you want to you can now reproduce the classic 'HDR look' using Photoshop, but you can also create more subtle HDR to LDR conversions. If you already own the *Adobe Photoshop CS5 for Photographers* book, there is a full account of the new Merge to HDR Pro controls in Chapter 7. If not, you can access this chapter in PDF form on the DVD that comes with this book.

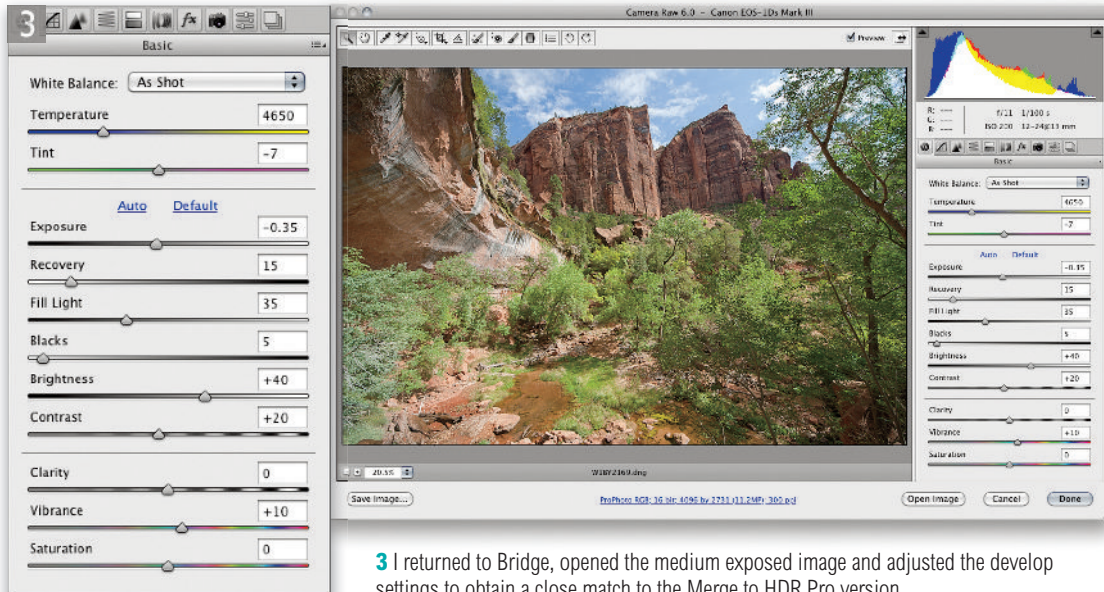
There are several reasons why the Merge to HDR Pro feature can be considered useful. You can use the HDR toning controls to produce the obvious HDR look that fans of HDR photography seem to like. HDR toning can be applied when converting a 32-bit Merge to HDR Pro image to 16-bits or 8-bits per channel, or can even be applied as an image adjustment via the Image Adjustments menu to standard images. The main reason for using Merge to HDR Pro is to merge a bracketed sequence of exposures into a single 32-bit master image and thereby record the extended tonal range of a captured scene within a single image. From here you can use the tone mapping controls provided in the Merge to HDR Pro dialog (shown opposite) to map these to a low dynamic range 16-bit or 8-bit version. This is one approach, although personally I prefer to use Merge to HDR Pro to create a 32-bit image, save this as a master and then use the Image ⇨ Mode menu to convert to 16-bit or 8-bit as a discrete separate step. This way one can preserve a master version and use the Image ⇨ Mode step to spawn different renderings, while preserving the master 32-bit version. Whichever approach is used it is best to always create Merge to HDR Pro images from raw files rather than rendered images (even if these are in 16-bit per channel mode). Even then I find HDR toning can lead to some colors not looking quite right. The steps on the following pages show how adding an additional Color blend mode layer can help improve the image appearance. A further benefit of using Merge to HDR Pro is that even when you aim to produce a fairly normal-looking conversion (as shown here), the shadow detail will usually end up being much smoother. There is a good explanation of the reasons for this in the PDF extract that's on the DVD.



1 To use the Merge to HDR Pro feature it is best to do so from raw originals. Here you can see three raw files selected where the default develop settings had all been synchronized.



2 I then went to the Tools menu in Bridge and selected Merge to HDR Pro... This opened the above dialog, where I applied the settings shown here. I clicked OK to create a new Merge to HDR Pro image.





5 The reason for adding this extra step is because I find it can help you achieve smoother, more natural-looking colors in a Merge to HDR processed image. For example, with this image there was an unnatural saturation boost in the sky. Adding the Color blend mode layer improved the look of the sky by making the sky look less saturated and the clouds look less blue. The rocks by the stream had a pale yellow cast in the highlights. The Color blend mode layer was also able to get rid of this and, again, apply a more natural-looking color.

Camera settings

Before you shoot a set of panorama photographs, I suggest you set the exposure setting to manual so that the exposures are all consistent, the aperture remains the same throughout and the white balance setting is also consistent (although if you shoot raw, you can apply a single white balance in the Camera Raw processing later).

Blend Images Together

When the Blend Images Together option is selected, Photomerge looks for the optimal borders between each image layer, color matches these layers and applies a layer mask. When Blend Images Together is turned off, an alignment match only is performed. This allows you to edit the layers individually before you apply the Edit ⇒ Auto-Blend Layers... command.

Photomerge

Photomerge can mainly be used to stitch photographs together to create panoramic compositions. There are other programs that can do this with varying degrees of success, but I would say that the Photomerge feature in Photoshop has now evolved to become one of the best panorama stitchers out there. The complex interactive layout dialog option from the old Photomerge has been removed and, instead, you are offered a simple choice of layout options, of which Auto is usually the best one to choose.

There are four main ways to use Photomerge. You can go to the File ⇒ Automate menu in Photoshop, and click on the Browse... button in the Photomerge dialog (circled in Figure 9.1) and select a folder of images, or browse through the folders on your computer to add specific photos. Or, if the images you wish to merge are already open in Photoshop, select the Open Files option. The easiest way though is to select the images you wish to merge via Bridge and then choose Tools ⇒ Photoshop ⇒ Photomerge. This also pops the same Photomerge dialog as shown in Figure 9.1,

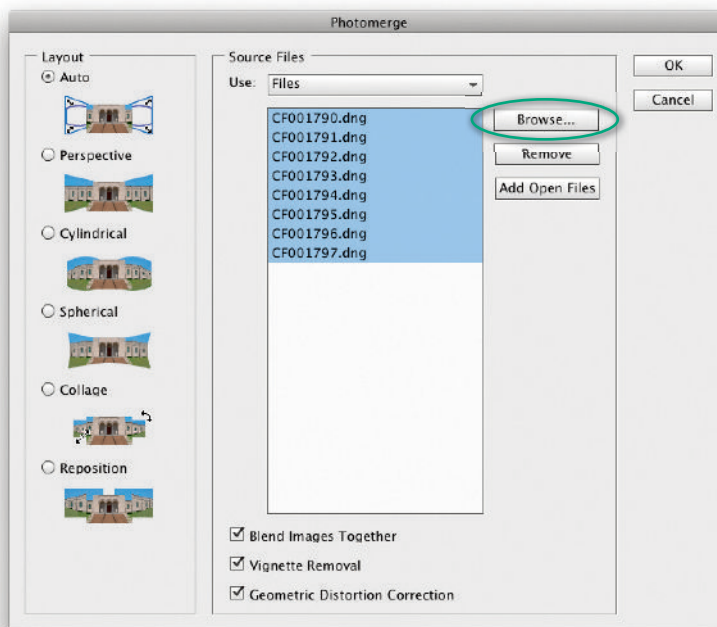


Figure 9.1 You can use the File ⇒ Automate ⇒ Photomerge... command in Photoshop, or choose Tools ⇒ Photoshop ⇒ Photomerge... in Bridge, to see the Photomerge dialog shown here.

where you can select the appropriate layout and blending options to create a Photomerge composite in one single step.

Alternatively, in Photoshop you can choose **File** ⇒ **Scripts** ⇒ **Load Files into Stack...** This opens the Load Layers dialog shown in Figure 9.2, where you can again manually select the photos you wish to process. When you click **OK**, this creates a single image in which all the selected photos are added as layers. Or, if you are in Bridge, you can simply go to the **Tools** menu and choose **Photoshop** ⇒ **Load Files into Photoshop Layers...** This too creates a single layered image, but without having to show the Load Layers dialog. Whichever method you choose, once the layered image is opened in Photoshop, you can then choose the **Edit** ⇒ **Auto-Align Layers...** option to select the desired layout blend method (see Figure 9.3) followed by the **Edit** ⇒ **Auto-blend Layers...** option to carry out the blending step. By breaking the Photomerge process down into discrete steps, this allows you to experiment more easily with the different layout and alignment options before you choose to blend the layers.

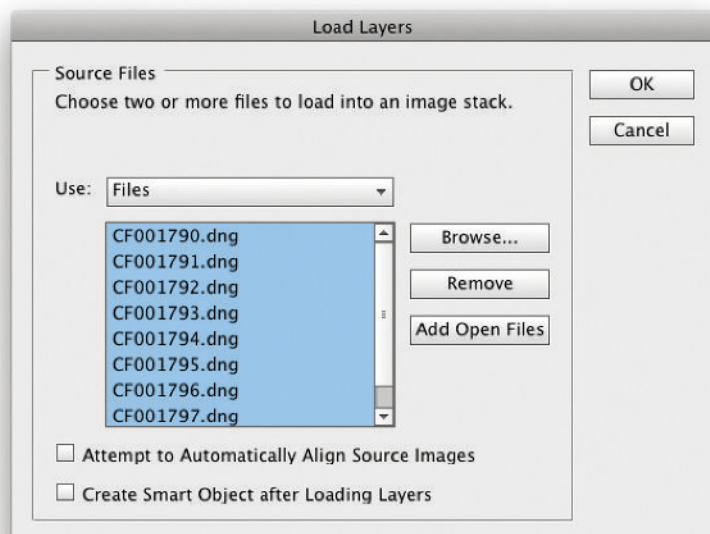
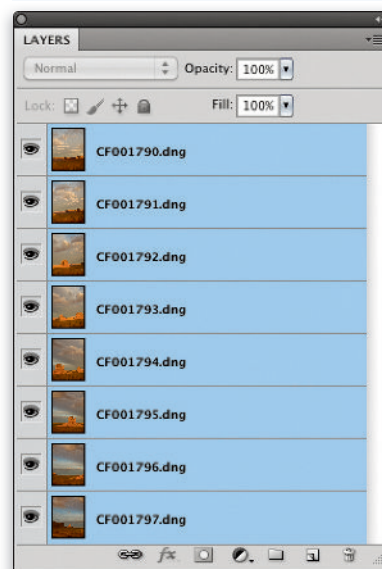


Figure 9.2 If you choose **File** ⇒ **Scripts** ⇒ **Load Files into Stack...** in Photoshop, or choose **Photoshop** ⇒ **Load Files into Photoshop Layers** in Bridge, you will see the Load Layers dialog shown here. Select the files that you wish to load as layers and click **OK**. With this dialog you also have the option to automatically align the source photos, but if you are going down this route, it makes more sense to apply the **Photoshop** **Edit** ⇒ **Auto-Align Layers** option separately.

Photomerge photography tips

For optimum results, you should aim for a 25–40% overlap between each photo. The focal length and focus should remain constant; do not attempt to zoom in or out as you are taking photographs. As you take your series of pictures rotate the camera in gradual steps, aiming to pivot the rotation around the center of the lens, and try to prevent the camera lens axis shifting too much. You can do this by hand-holding the camera but, to get the best results, you could consider using a tripod head like the Pan head from Manfrotto™ which, when used with the angle bracket clamp, will let you center the rotation accurately around the center of the lens axis. The captured photos should then align more easily in Photomerge.



Lens Correction options

The Lens Correction options will in most cases help you achieve better panoramic images. The Vignette Removal applies exposure compensation to the edges of any images that have darkened corners. This is a common problem with certain wide-angle lenses, although you can also correct for this in Camera Raw directly before you carry out a Photomerge or an auto-alignment. Geometric Distortion Correction can compensate for barrel or pincushion lens distortion, but will add significantly to the Photomerge processing. If you are blending images that were shot with a 'recognized' fisheye lens, Photomerge switches on the Geometric Distortion option automatically.

Basically, if you know which Photomerge layout mode and Lens Correction options you need to use, it is always easier and quicker to apply Photomerge directly as shown in Figure 9.1. If you are unsure as to which settings would work best it can be advantageous to use the indirect Load Files into Stack (also referred to as Load Files into Photoshop Layers in Bridge) method, since this allows you to open the images first before you decide which Auto-Align method to use. For example, you can use the Photoshop or Bridge method to open a selected number of files as Photoshop layers in a single image. In Photoshop you can then choose Edit ⇒ Auto-Align Layers (Figure 9.3), and select a layout and lens correction option to see what kind of panorama alignment this produces. If you're not pleased with the outcome you can simply undo the Auto-Align step, select Auto-Align Layers again and choose a different one instead. Once you feel you are on the right track you can then select the Edit ⇒ Auto-Blend Layers option (also shown in Figure 9.3) to apply the Panorama blend method. This allows you to complete the Photomerge alignment and blending.

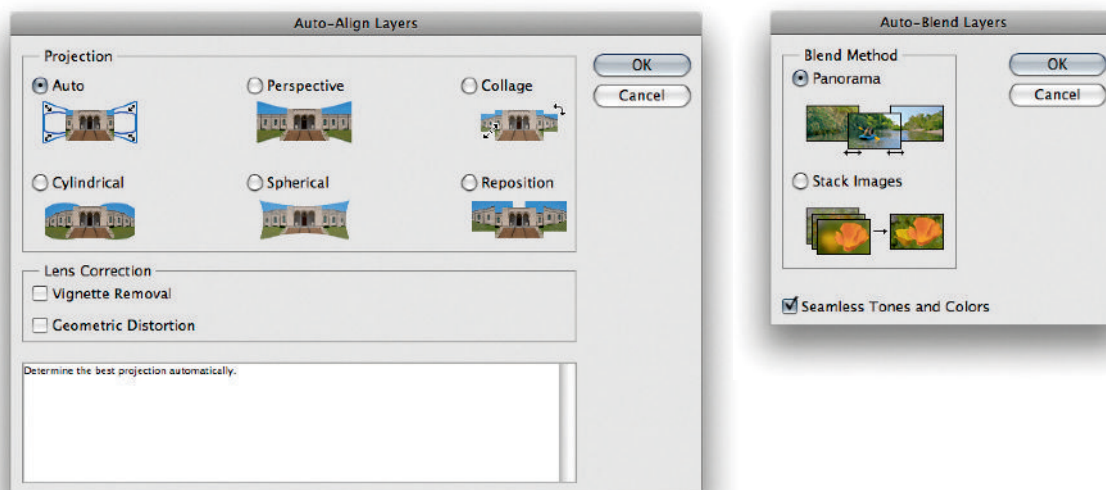


Figure 9.3 If you want to align the layers in a layered image you can do so by choosing Edit ⇒ Auto-Align Layers. This opens the dialog shown here on the left, where the Projection/Layout and Lens Correction options are identical to those found in the Photomerge dialog seen in Figure 9.1. You can choose a combination of settings and click OK to apply the desired alignment. Afterwards, you can choose the Edit ⇒ Auto-Blend Layers option and select the Panorama blend method.

Resizing the source images

When you create a panorama image you will end up with a photograph that is considerably bigger in size than the individual photographs used to build the panorama. This was not such a concern when digital cameras could only capture small sized pictures anyway, but these days we often find it necessary to scale the individual source images down in size so that the resulting panorama doesn't end up being too big. If you are working from raw file originals, one way to do this is to go to the Workflow options in Camera Raw (Figure 9.4), change the file opening size and click 'Done' to apply the new size setting to the selected photos. Do this and the individual photos will open as smaller images and as a consequence of this the Photomerge processing can be much faster. Doing a test merge with images already downsampled in Camera Raw will also be a lot faster, particularly if you are working from 60 MP original captures as shown below in Figure 9.4.

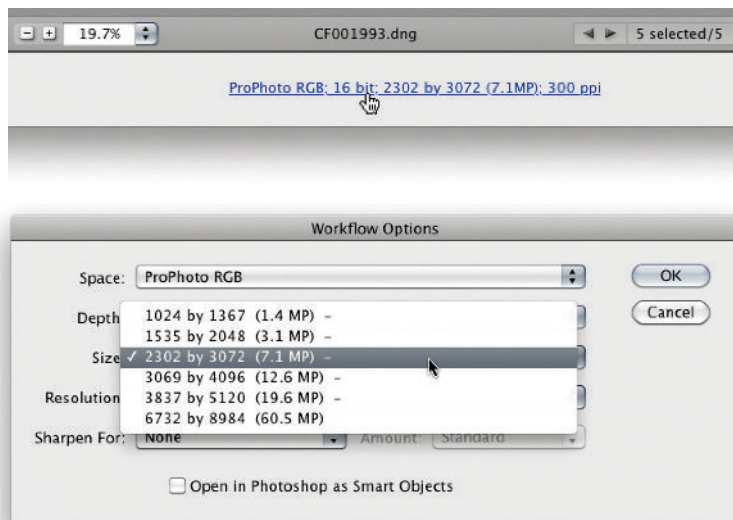


Figure 9.4 The Camera Raw Workflow Options can be found at the bottom of the Camera Raw dialog. Click on the blue, underlined text to open the Workflow Options dialog and change the Size settings to apply a smaller or bigger file opening size. Remember to click on the Done button in Camera Raw when you are finished to apply this new setting to the selected photos.

Auto-Blend Layers

Auto-Blend Layers analyzes all the selected layers and masks the layers such that each area of the final composite is defined by a single portion from each individual layer. The layers themselves are cut out using a jagged outline that masks the edges of each layer element. This will usually produce a composite free of overlapping picture elements and fuzzy sections. We always keep the Seamless Tones and Colors option checked (see Figure 9.3) as this helps improve the blend smoothness between the layers.

File size limitations

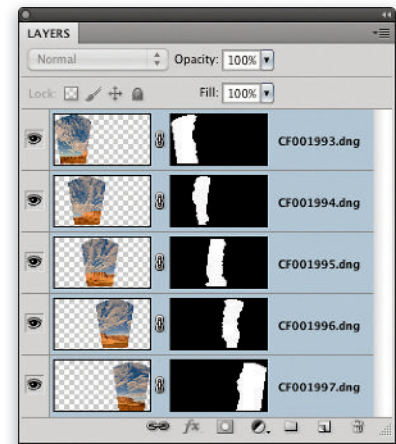
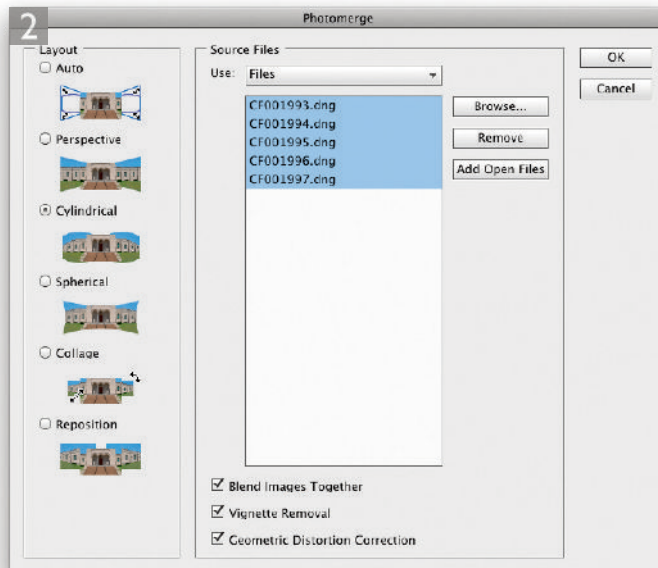
If you find the Photomerge process stalls during the processing, this is probably because the individual files are too big and are preventing Photomerge from working successfully. You need to either install more RAM or work with smaller files. It may also be because you have the Geometric Distortion Correction option checked, which can make big demands on the file processing.

A simple, one-step Photomerge

I thought I would start with a simple example of how to create a Photomerge image. The Auto layout option is usually the best choice to select here, as it analyzes the source images first and tries to work out in advance which layout method (Perspective, Cylindrical or Spherical) will produce the best-looking panorama image. Although the Auto option gets it right most of the time, it doesn't always manage to guess correctly. So here's a tip. If you are combining a series of images to produce a landscape panorama, the Cylindrical layout method will usually keep the horizon line level in the picture (although not always straight). This is the layout method I select when I know it's the best one to use.



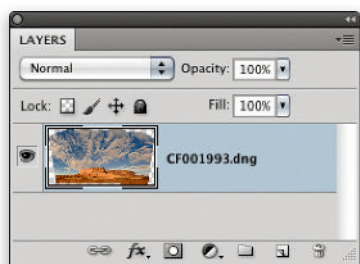
1 I began by opening Bridge and made a selection of the photographs that I wished to merge into a panorama. If you are working from raw files, you may at this stage want to open these pictures up in Camera Raw and make sure that the Camera Raw settings are synchronized across all the images. In addition to this, it can be a good idea to check the Workflow Options (mentioned on page 327), to set the file opening size of each image to an appropriate individual size (if you attempt to merge a series of full-size digital captures, you can end up with a really huge panorama image file). Once I had done that, I went to the Tools menu in Bridge and chose Photoshop ⇒ Photomerge...



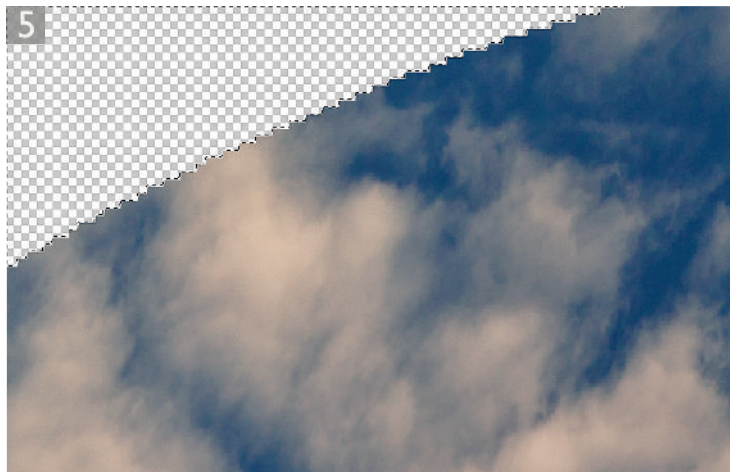
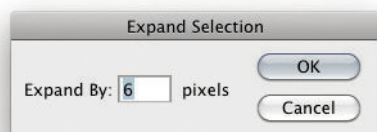
2 Here is the Photomerge dialog, showing the photos selected in Bridge as the source files for the Photomerge. I selected the Cylindrical layout option and checked all the options at the bottom: Blend Images Together, Vignette Removal and Geometric Distortion Correction, then clicked OK to build the panorama. The resulting layers and layer masks can be seen in the Layers panel shown on the right.



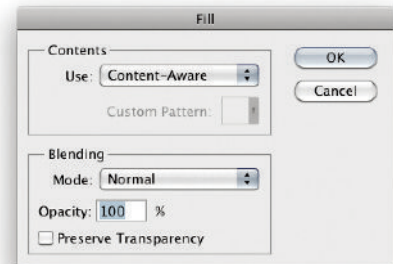
3 Here is the completed panorama in which the selected images had all been merged together but not yet corrected using the Free Transform command.



4 The image seen previously in Step 3 showed some distortion in the resulting merge. The sky was too wide and the foreground too narrow. After merging the layers (shown in the Layers panel on the left) I used the Free Transform tool from the Edit menu (**⌘ T** **ctrl T**). By holding down the **⌘ ⌥** **ctrl alt** keys (plus the **Shift** key to constrain to horizontal), I was able to drag the upper corners in and the lower corners out. Fortunately, the horizon was nice and straight (a function of using Cylindrical vs. Auto in the Photomerge dialog).



5 Even with the corrections made in Free Transform, the upper left and right corners of the image had fully transparent areas that needed filling in. In days gone by, this was always a real pain. Trying to get the natural gradation and detail such as clouds to look real using even using the clone stamp or the healing tools was a chore. Well, the star of Photoshop CS5 has to be the Content-Aware Fill feature, and it did the trick in this image. I used the magic wand tool (yes, I'm willing to admit I do have a use for the magic wand) to select the transparent areas. To be sure the selection was big enough for Content-Aware Fill to gradation and blend, I used the Expand Selection command found under the Select ⇒ Modify submenu. I entered a 6 pixel expansion and clicked OK.



6 After expanding the selection, I used the Edit ⇨ Fill command and selected the Content-Aware option from the Contents drop-down menu and used a Normal blend mode. The result is shown above and the final image after cropping is shown below in Figure 9.5.

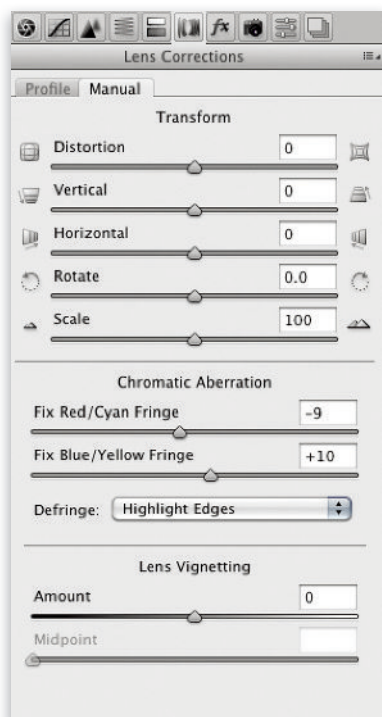


Figure 9.5 The original five images were captured hand-held with a Phase One 6 x 4.5 camera with a 45 mm lens and P 65+ back. The final image size was 67" x 36" at 300 PPI and was 1.24 GB in size when flattened.

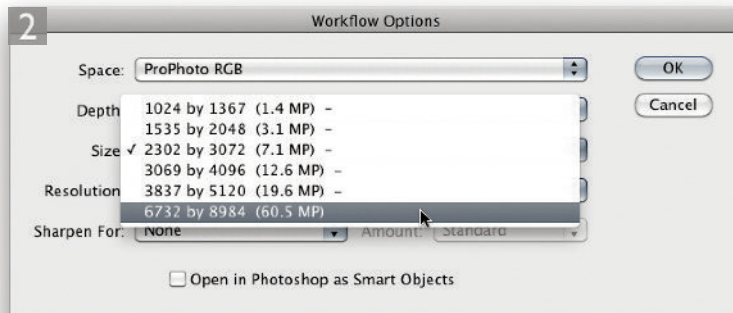
A three-step Photomerge

The Photomerge command (from within Bridge) works very well almost every time. The Photomerge command is essentially carrying out a three-step process in which the first step is to add all the images as layers in a Photoshop document then auto-align the individual layers. The final step is to carry out an Auto-Blend operation in which the layers are aggressively layer masked.

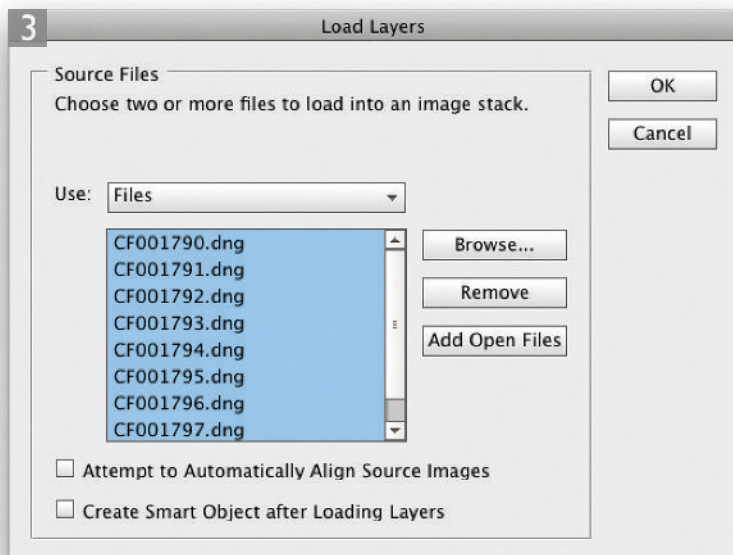
The following tutorial shows an alternative approach in which the Load Layers, Auto-Align and Auto-Blend Layers steps are carried out separately, one step at a time. By breaking the Photomerge process down into separate steps, you can have more control (if you need it) over how the images are merged together.



1 The first step involved opening a series of images inside Camera Raw hosted by Photoshop. All eight of the images were selected and ready to open in Photoshop. While the Auto-Align command I used later controlled both the vignetting and optical distortion, the one thing this can't fix is chromatic aberrations. You therefore need to fix those inside Camera Raw. Here, I made the corrections needed and also added a Defringe: Highlight Edges setting.



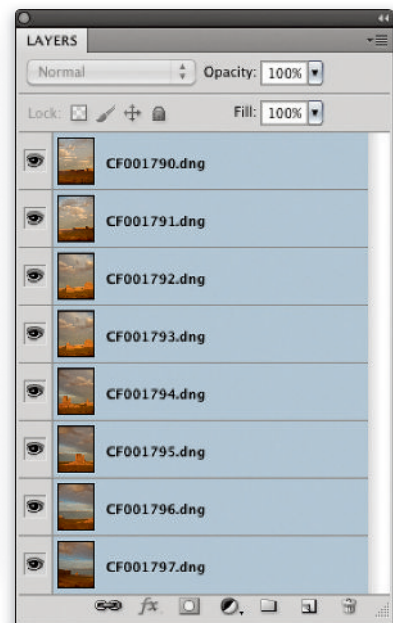
2 After making the required image adjustments for the eight images in Camera Raw, I clicked on the Workflow Options button to change the settings. Prior to doing the full resolution merge, I had tested the images at a lower resolution (the 7.1 MP setting, which is checked above). Since I now wanted to do the final merge, I selected the full 60 MP resolution as well as selecting Pro Photo RGB and 16-bit for the bit depth. I clicked OK to open all eight images into Photoshop.

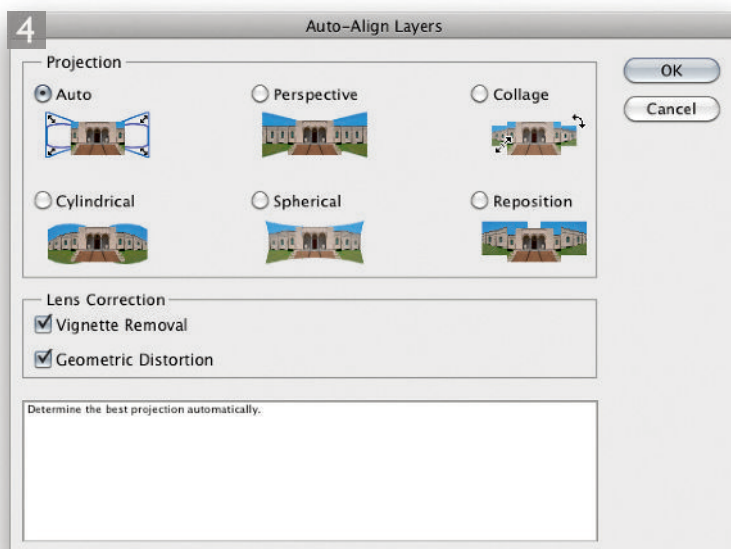


3 Once I had the eight images opened in Photoshop, I used the Load Layers function from the File ⇒ Scripts ⇒ Load Files into Stack... menu. The Load Layers dialog shown above allowed me to select all of the open images. At this point I decided not to attempt to align the source images nor to create a Smart Object. Eventually I would do both steps, but in the early stages I wanted to maintain the maximum flexibility. The Layers panel on the right shows the resulting layer stack that had yet to be aligned and blended.

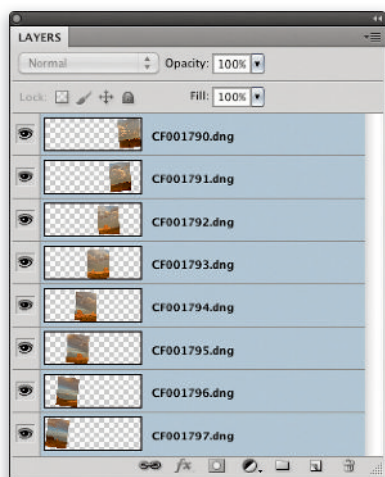
Carry out a low-res test first

If you have a large selection of medium or large sized images, these can take a quite while to process. If you want to see a quick preview of how such a Photomerge will look, we suggest you run the Photomerge command with the Camera Raw Workflow Options set to the smallest size possible. Once you are satisfied with the way the panorama is looking, repeat the command, but at the larger pixel size.

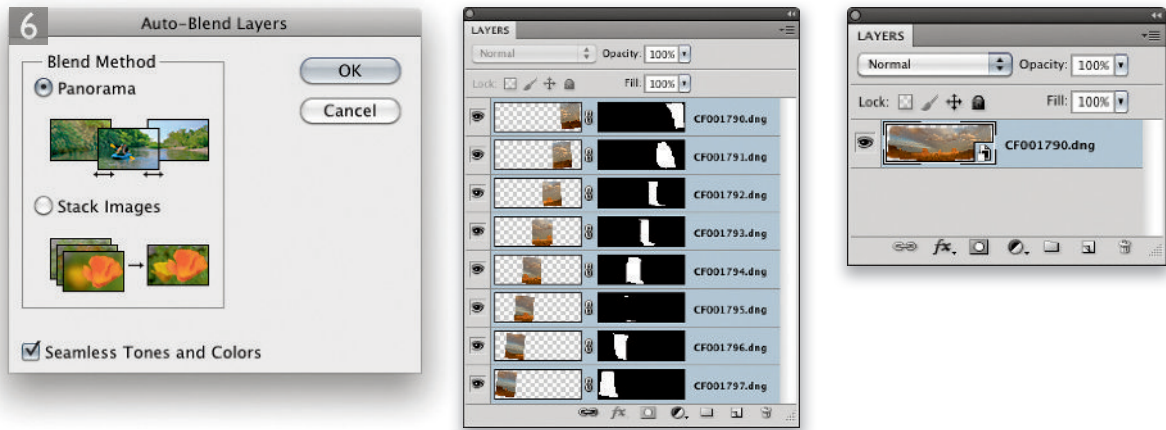




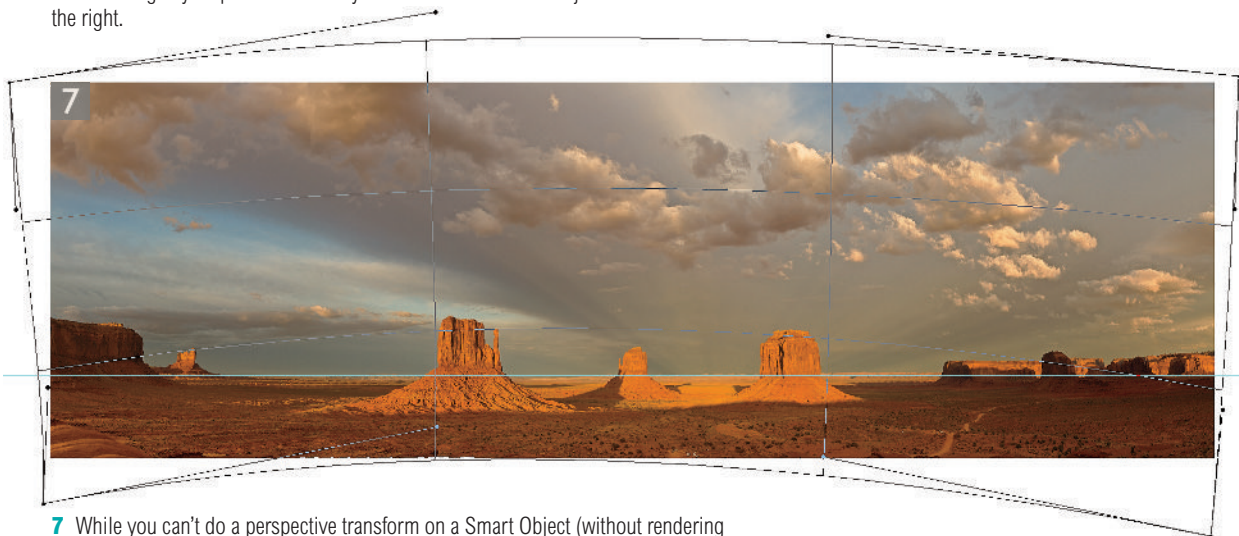
4 Once the images were loaded as layers in Photoshop (and after selecting all the layers as shown in Step 3) I used the Auto-Align Layers command found under the Edit menu. Since I had already corrected the Chromatic Aberration but not the lens distortion or vignetting, I made sure to check those options. I also chose the Auto projection option (even though my tests and natural inclination would be to choose Cylindrical). However, the problem I've found with Auto is that the resulting merge tends to lift up the sides (as you'll see in Step 5). This series of images was shot from a leveled tripod (for image quality reasons) and while I had been pretty careful, as is often the case when doing wide panoramas, the result needed correcting.



5 The Auto-Align command from Step 4 resulted in all of the image layers being transformed into position. The result was a pretty good alignment (although with an arc that would need correcting). The next step would deal with the blending, but not the distortion correction just yet. With all eight layers selected, I chose the Auto-Blend Layers command from the Edit menu.

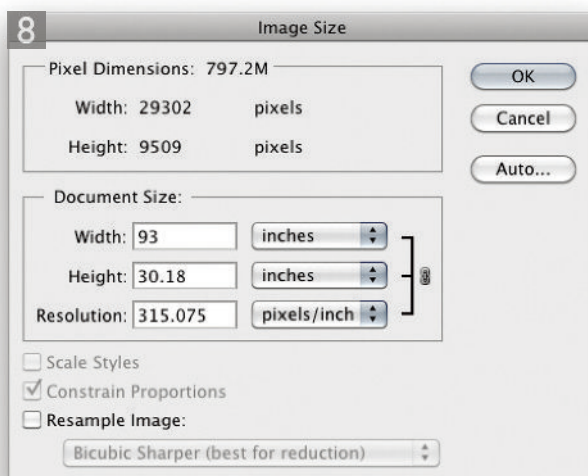


6 The Auto-Blend Layers command is the third manual step of the three-step Photomerge. Here, I chose the Panorama Blend Method and made sure to check the box for the Seamless Tones and Colors (which is really a fancy phrase for “to blend really well”). The result was layer masks on each of the eight layers that resulted in an excellent blend of the images. Since the overall images had an upward arc that needed correction, rather than merging the layers I wanted to take the eight layers with their masks and turn them into a Smart Object, retaining the individual layers and masks while allowing me the ability to treat all eight images as a single image. I made sure all eight layers were selected and selected the Convert to Smart Objects command from the Layers ⇨ Smart Objects menu. The resulting Layers panel with the layers turned into a Smart Object is shown above on the right.



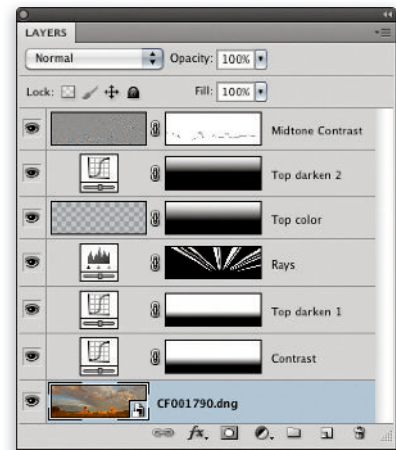
7 While you can’t do a perspective transform on a Smart Object (without rendering the object), you can use the Warp command found under the Edit ⇨ Transform menu. As shown above, I grabbed the warp transform handles and moved the center up while moving the ends of the image down. The Warp command was able to essentially remove the arc induced by the Auto-Align Layers command. Converting the Layers to Smart Objects maintained full layer and mask editability.

8 After doing the Warp transform, I wanted to confirm the final size of the assembled panorama. The original images were all shot just before sunset in Monument Valley, Utah, with a Phase One 6 x 4.5 camera and a 45mm lens with a P 65+ 60 MP camera back. In Step 2, I had chosen a resolution of 300 PPI, but I had no idea what the final dimension of the merged image would be. I used the Image Size command from Image menu to alter the dimensions of the image. I deselected the Resample Image option because I didn't want to actually interpolate the image. I set the width to 93" (the maximum length that the Epson driver can print to on Mac). Since the Resample Image was unchecked, the Resolution changed to 315.075 PPI and the Height ended up as 30.18".





9 Once the image was sized, I needed to do a few tone and color tweaks for the final image. In the Layers panel on the right, you'll see how I added four graduated adjustment layers. I also added a graduated color blend layer to cool down the top of the sky. The final adjustment was to add a MidTone Contrast layer on top with a mask to keep the midtone contrast boost from affecting the towers' edges. The final assembly is shown below. The image above is at a 100% zoom showing people (who I did see when I shot) watching the sunset. You can just make out the camper off the road in the full shot below.



Viewpoint selection

It can, of course, be hard to predict the final outcome of a spherical photomerge, especially if you intend producing an equirectangular projection such as the one shown on page 349. The thing to watch out for is foreground objects appearing too big, unless you intend to make this happen. When shooting an interior it can therefore help to keep the camera viewpoint high to help avoid foreground objects appearing too enlarged.



Figure 9.6 This shows the Absolute 360 Precision head in use.



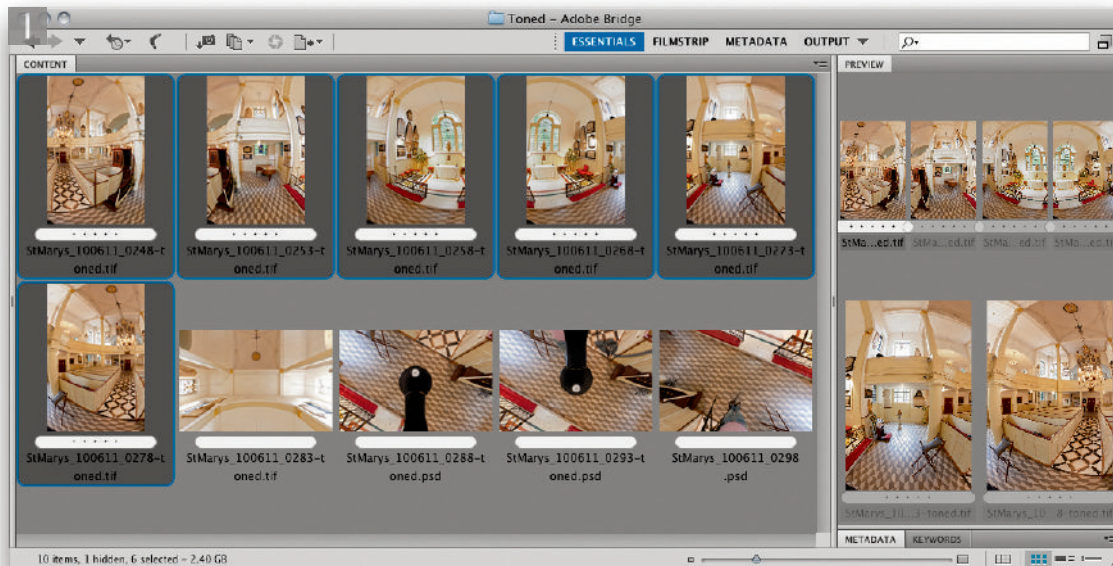
Figure 9.7 A leveling device is essential for ensuring that the tripod head is as level as possible before you shoot.

Stitching a spherical 360° panorama

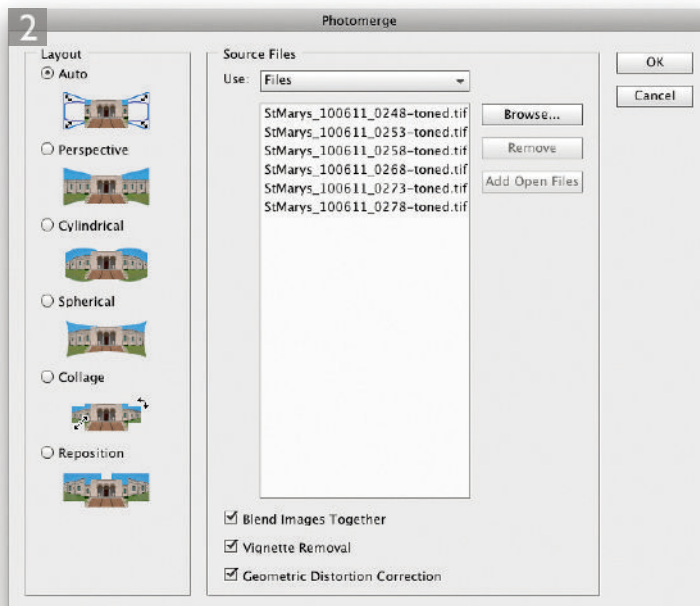
When Photomerge was updated for Photoshop CS4, one of the objectives was to improve the ability to stitch together photographs that had been shot using certain fisheye lenses such as the Canon 15 mm lens. With the advent of Photoshop CS5, it is now possible to create successful photomerges with almost any lens. If there is no lens profile available for a particular lens, then it is fairly easy to build one using the Adobe Lens Profile Creator utility. Another thing that has changed is that in Photoshop CS5 you can now achieve more successful photomerges when blending fisheye lens photos that have been shot in 'portrait' mode. I mention all this is as a precursor to the following technique in which I show how you can create a spherical 360° panorama using Photoshop. Now, it has to be said that there are other ways of doing this. In particular, there is a program called PTGui (www.ptgui.com) that most professionals would prefer to use when creating such panoramic images. What I have done here though is to show how you can achieve similar results by using Photoshop CS5 only, based on a technique that was first demonstrated by Russell Brown.

Panorama shooting tips

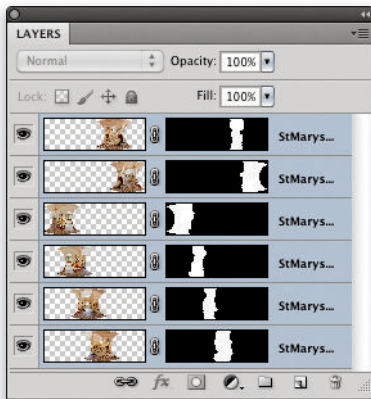
As you might expect, there are a number of things you need to be aware of when shooting photos to build a panorama. Firstly, you need to use a special tripod head such as the Absolute 360 Precision head, which I used to take these photos (Figure 9.6). This particular head was calibrated for the Canon EOS 1Ds Mk III body plus Canon 15 mm lens so that the central axis position of the lens was centered correctly when rotating the camera in any direction. With a camera lens combination such as this it was necessary to shoot six frames at the precisely marked 60° click stop positions in order to capture the main 360° panoramic view. With this head I was also able to tilt the camera precisely upwards and directly downwards to capture the zenith and nadir viewpoints. With an interior like the one I photographed here I thought it useful to bracket the exposures as well so that I could use Merge to HDR Pro to prepare optimum images for the following Photomerge steps. It is essential that the tripod head is kept absolutely level so that the horizon line will eventually align correctly at either end of the Photomerged result. To this end it is helpful to use a leveling device such as the one seen in Figures 9.6 and 9.7) to make sure that the camera is perfectly level before shooting.



1 This shows a series of photographs that were shot of a church interior at 60° intervals using a Canon EOS 1Ds Mk III camera plus Canon 15 mm fisheye lens, mounted on the Absolute 360 Precision head. I also took one shot pointing upwards and three shots directly downwards, to record the zenith and nadir viewpoints. To create the spherical panorama it was important that I selected only the main panorama shots first.



2 With the above shots selected I chose Tools ⇒ Photoshop ⇒ Photomerge..., which opened the Photomerge dialog shown here, where I selected the Auto Layout option. I also checked the Blend Images Together, Vignette Removal and Geometric Distortion Correction options and clicked OK.



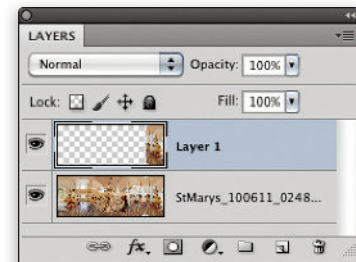
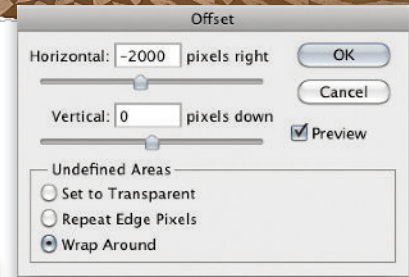
3 Since I was processing the shots that were selected in Step 1 at their native size, it took a while for Photoshop to generate the Photomerge panorama. Here you can see how the panorama image is made up of the six auto-blended layers and how it also includes a complete panorama view of the church interior with a fair degree of overlap at either end. At this stage there was no need to worry about the relative positions of the elements in the composition just yet. With this technique you have complete flexibility to centralize the image composition later (see Step 9).



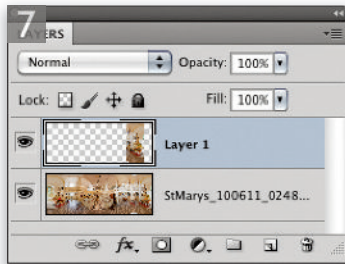
4 I next went to the Layer menu and chose Flatten Image. I now needed to crop the panorama in order to achieve nice, clean edges on the left and right sides. You can do this using the crop tool and, if necessary, select the Image ⇒ Trim... command to make sure the image is trimmed as tightly as possible.



5 I now needed to prepare the image so that it could wrap around on itself. To do this, I first went to the Filter menu and chose Other ⇒ Offset... This allowed me to offset the horizontal axis which, as you can see, highlighted the fact that the left and right edges didn't perfectly match up yet. The main thing to point out here is that it is the Horizontal axis only that needs to be shifted; the Wrap Around option must be selected at the bottom and it doesn't really matter how much you enter here, as long as you offset the image sufficiently to work on correcting the extent of the overlap.



6 Next, I used the **⌘ R** / **ctrl R** shortcut to reveal the rulers and dragged out a guide to align precisely with the point where the overlap occurred. I made a rectangular marquee selection of the right-hand portion of the image up to the guide. I then went to the Layer menu and chose New ⇒ Layer via Copy to make a copy of the selected area. I could now move this copy layer horizontally using the move tool or by selecting the move tool and nudging the layer using the arrow keys.



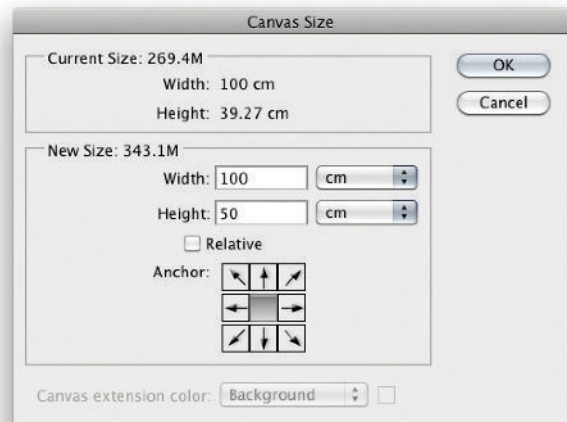
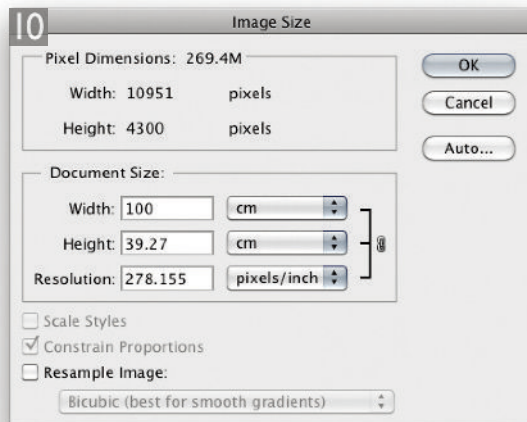
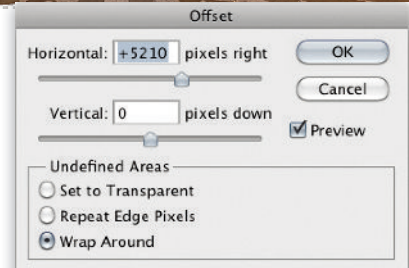
7 The idea here was to position the copy layer so that it aligned perfectly with the opposite edge of the blended panorama image. It is essential that you only nudge the layer left or right. If you remembered to level the tripod head perfectly at the time the photos were taken, the opposite ends should align perfectly. If not, you may want to include an extra step where you drag with the ruler tool across the image to define the correct angle of straightness, then after doing this, click on the Straighten button in the tool Options bar.



8 Once I had done this, I added a layer mask to the copy layer and applied a linear, black to white gradient on the mask in order to fade the edge where the two ends joined. I then cropped the panorama to the outer edge of the copy layer and again flattened the image to produce the version shown here.



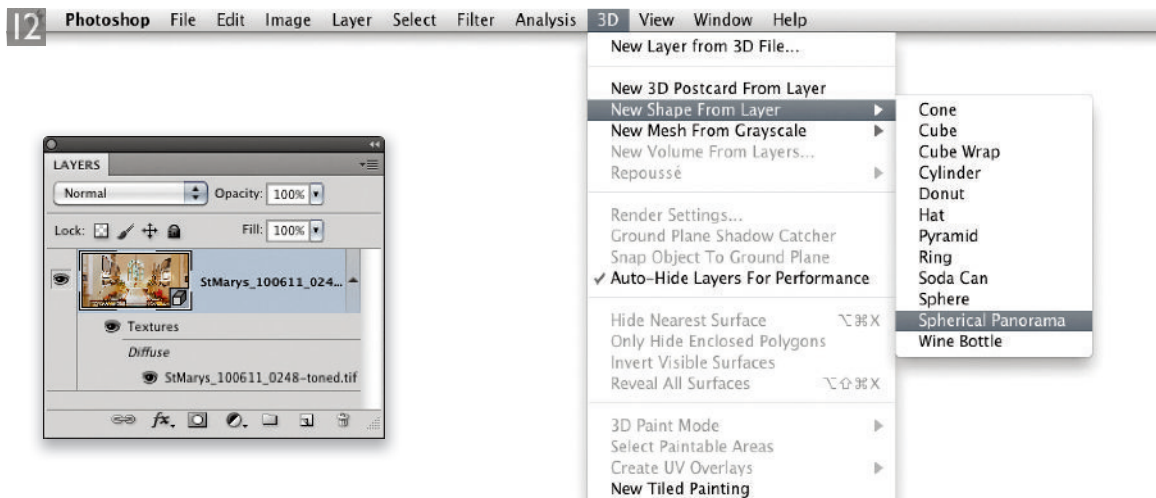
9 I now had a perfect 360° Photomerged panorama that would indeed wrap around on itself. I was able to test this by going to the Filter menu and choosing Other ⇒ Offset... again. If the end goal is a 2D image rather than a Quicktime® spherical panorama, the second Offset filter Step is crucial here for determining how the panorama looks. For example, here I felt it was important for the altar to be positioned centered in the photograph.



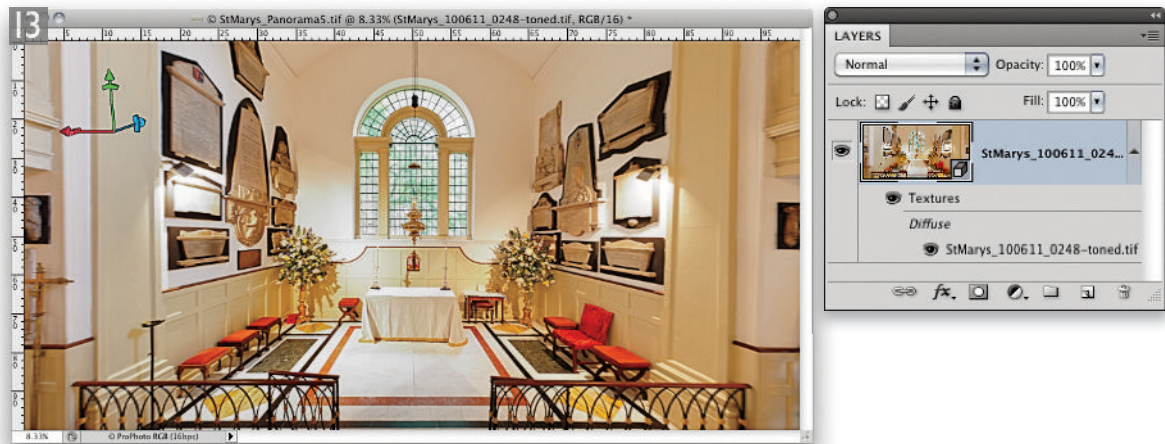
10 I now needed the image to have an exact 2:1 aspect ratio. To do this, I first went to the Image menu, chose Image Size... and entered an even integer value for the image width (and unchecked the Resample Image option to allow the pixel resolution to auto-adjust). I then went to the Image menu again and this time chose Canvas Size... Here, I entered a Height value that was exactly half that of the image's width.



11 OK, we now had a panorama image in which the canvas size had been adjusted to the correct 2:1 aspect ratio, from which one could generate a spherical panorama. At this stage it looked like there was a lot missing from this scene, but if you refer to Step 14, you can see how the equirectangular projection actually exaggerates these missing sections of the panorama.



12 At this point I was ready to test the effectiveness of the spherical panorama image I had just created. To do this, I went to the 3D menu, chose New Shape From Layer and selected the Spherical Panorama option.



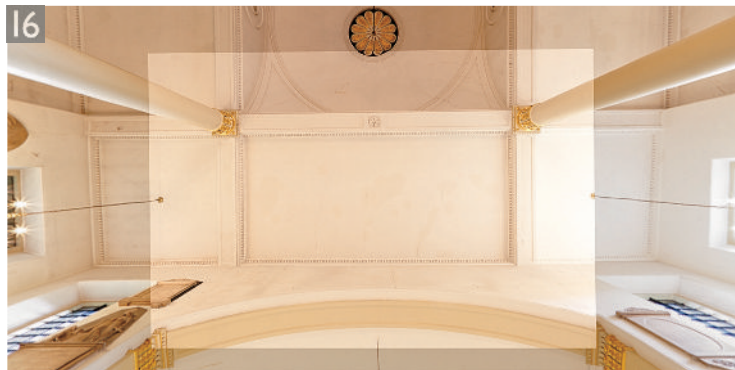
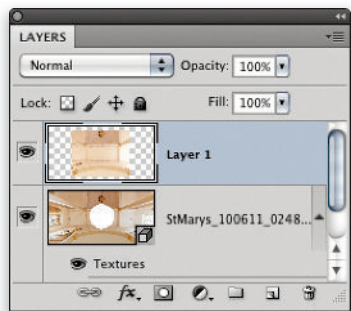
13 I could now use the 3D zoom tool to zoom out a little and use the 3D rotate tool to navigate the image in Photoshop as a 3D spherical panorama.



14 There still remained the question of how to fill the ceiling and floor sections of the image. As you can see in this ceiling view, the missing area wasn't so big, but this is where it was important that I had also shot the zenith and nadir viewpoints in order to make the spherical panorama complete.



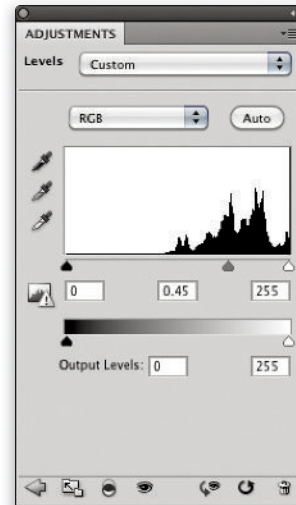
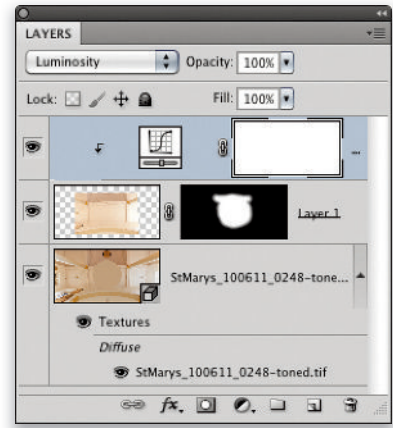
15 If you refer back to the Bridge folder view shown in Step 1, you'll see that I had shot a zenith view of the ceiling of the church interior. The important thing to point out here is that while this shot was also taken with a fisheye lens, I knew that in order to place it within the 3D view, I would need to remove the geometric distortion. Therefore, the shot you see here was processed in Camera Raw using the new auto lens corrections feature to remove the distortion. I chose **Select ⇒ All** to select the entire image and then chose **Edit ⇒ Copy** to copy the selected area.



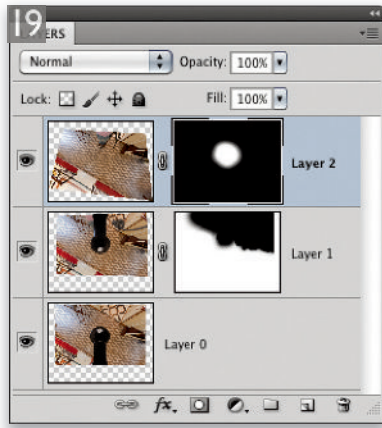
16 I then used the **Edit ⇒ Paste** command to paste the selection as a new layer in the 3D Spherical panorama view. However, even though the source image was of the same resolution as all the other photos used in this panorama assembly, it was necessary to use the **Edit ⇒ Transform ⇒ Scale** command to scale this image up by around 250%. I then carefully nudged the position of this pasted layer so that it matched the remaining image.



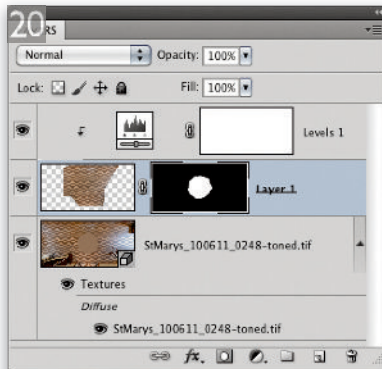
17 With this layer scaled and positioned correctly, I added a layer mask filled with black and then used the brush tool with white as the foreground color to paint over the layer mask to gradually reveal the contents. The problem now was that the pasted layer was brighter than the background, so I added a Levels adjustment and clicked the dividing line between the layer and the Levels adjustment to form a clipping group. I then adjusted the Levels gamma slider to make the layer darker (note that I used the Luminosity blend mode to preserve the saturation). I then went to the Layers panel fly-out menu and chose Merge Down, which merged the layer, in this case, rendering it as a 3D object.



18 All I had to do now was to repeat the same steps for the floor view or nadir viewpoint. You are normally advised to make three exposures when photographing the nadir view. You can take one with the camera pointing downwards and then another with the head swung around to the other side. Lastly, it is a good idea to memorize the position of the camera when pointing downwards, remove it from the tripod and make a further hand-held shot as best you can. With these three (auto-lens corrected) photographs it should be possible to create a view with the tripod, tripod head and photographer removed from the scene.



19 I placed the three photographs shown in Step 18 as layers, selected all the layers (**⌘ A** **ctrl A**), chose **Edit ⇒ Auto-Align Layers...** and clicked OK to the Panorama option. This aligned the layers precisely. I then applied layer masks to the upper two layers so that I could end up with the image you see here, where the tripod legs and head had successfully been removed. I then flattened the image, made a selection of the floor area and chose **Edit ⇒ Copy** to copy the selection contents. To be honest, when it comes to editing a photo like this in Photoshop, the hand-held shot would have sufficed. However, if you are using a program like PTGui to build the panorama, it is advisable to carry out these extra steps.



20 I then repeated Steps 16 and 17, pasting the floor selection as a new layer in the 3D spherical panorama view. Again, I scaled and rotated the pasted layer so that the floor pattern matched and applied a layer mask to reveal the layer over the center portion of the image only. When I was happy with the placement I adjusted the brightness of the pasted layer using Levels. Then, I went to the Layers panel fly-out menu and chose **Merge Down**.



21 I now had a complete 3D spherical panorama image that had been created entirely within Photoshop. Lastly, I double-clicked on the background in the Layers panel (circled) to reopen the 2D version of the image. The top view shows the image previewed as a complete panorama. Here you can see how the floor and ceiling sections have been added top and bottom, but you'll also notice the zig-zag edge Photoshop leaves top and bottom. In terms of how this image can function as an exported spherical panorama Quicktime movie, it's not such a big problem, but still not as neat a result as, say, a PTGui export. If, on the other hand, you wish to present a 2D flat view, then I reckon it is usually best to crop such images top and bottom anyway.

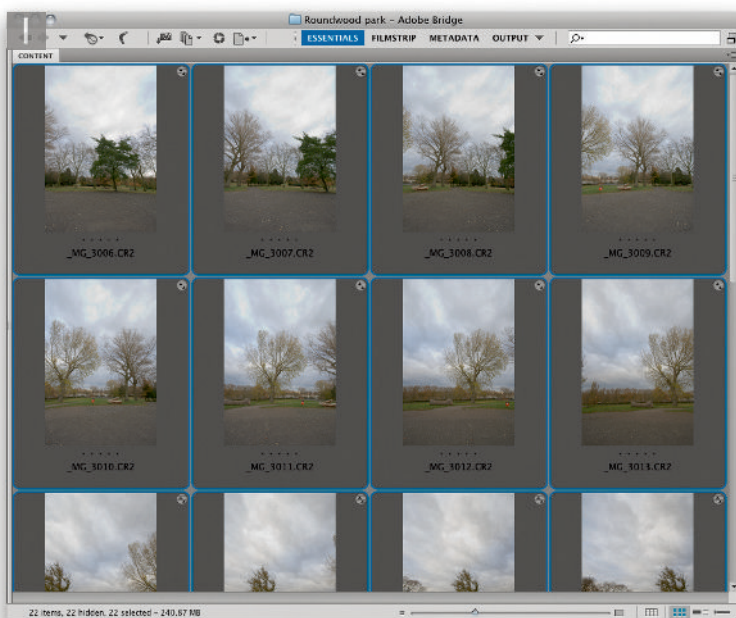
Quicktime® exports

To prepare for an export as a Quicktime VR or Flash movie, you'll need to edit the 3D view version by applying a fixed pixel value crop. There is also a Flash version of this image available to view on the DVD (with help from Rod Wynne-Powell).

How to create an aerial fisheye lens effect

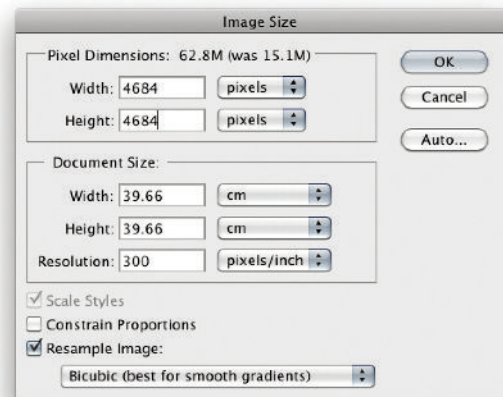
Music fans of a certain age (especially those who liked progressive rock) may remember the band Yes, whose cover artwork would often feature the imaginary planet worlds of Roger Dean. This shows a simple way you can transform a panoramic photograph into an aerial fisheye view of a scene. I would definitely regard this as a novelty effect, but it is nonetheless a fun experiment to carry out and you never know when a client will ask you to come up with a quirky approach to a brief. For example, I have seen this technique being used in a recent UK ad campaign.

1 I began by selecting a group of photographs in Bridge which when merged together using Photomerge would produce a 360° panoramic image. To do this, I went to the Tools menu in Bridge and chose Photoshop ⇒ Photomerge... I then blended the layered photos together using the methods described earlier in this chapter to produce the flattened panorama shown below.

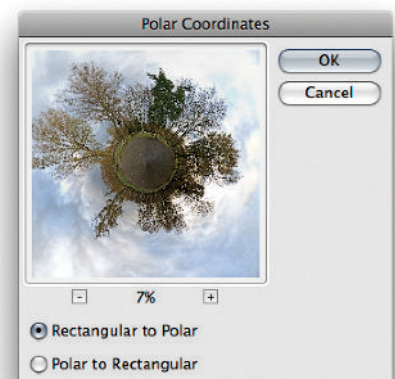




2 I flattened the image, cropped the skyline tightly and used the Image Size dialog to stretch the photograph and make it into a square image (note the Constrain Proportions box was left unchecked). I then went to the Image menu and chose Rotate Canvas \Rightarrow 180°. This prepared the image for the final step.

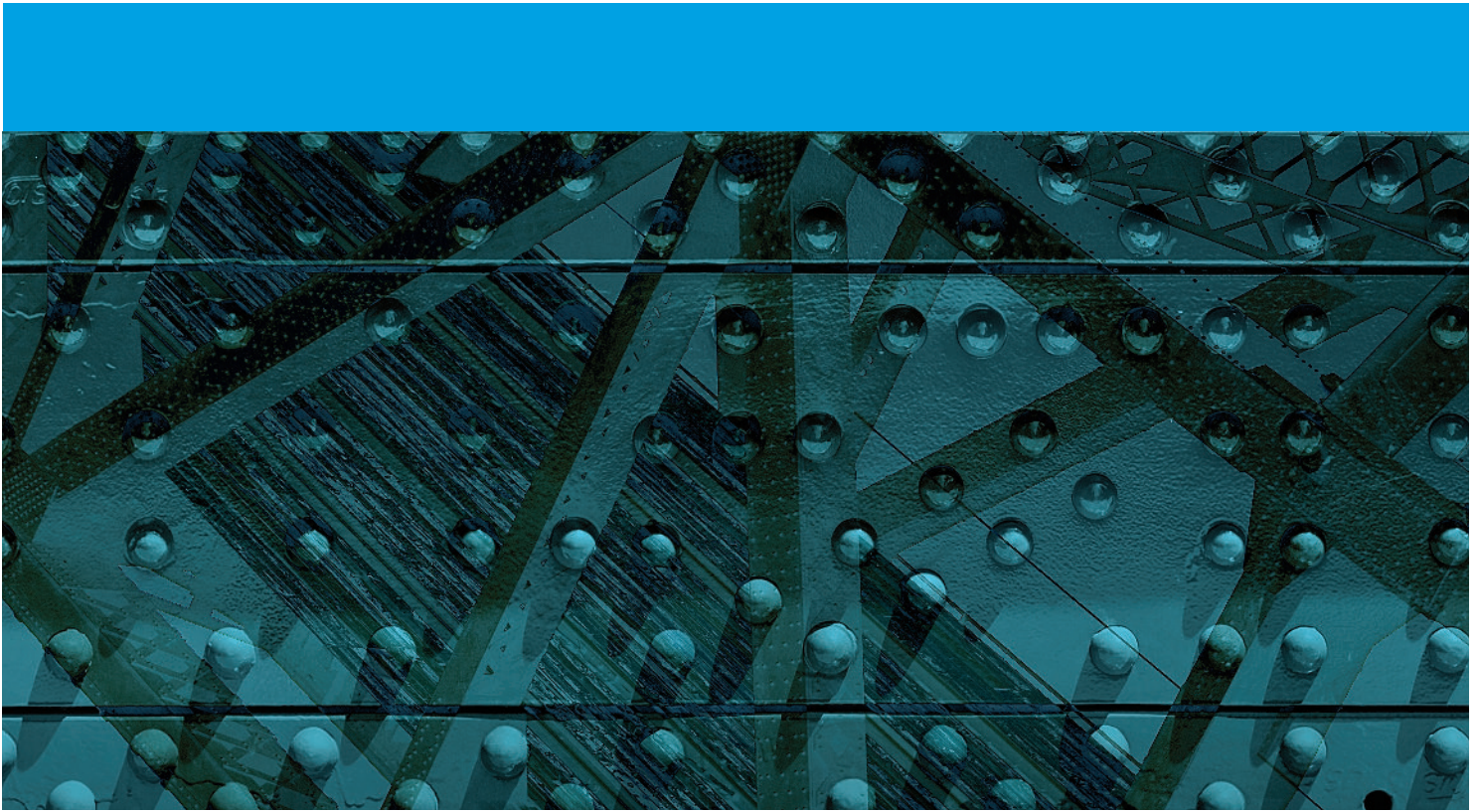


3 I went to the Filter menu, where I chose Distort \Rightarrow Polar Coordinates and clicked on the Rectangular to Polar option. This produced the finished result shown here, where all I did was to crop the photograph slightly and use the healing brush and clone stamp tools to retouch out the single join line that ran from the top to the center of the photograph.





Photograph: Jeff Schewe.
Sinar 4 x 5 Camera | 240 mm | 100 ISO Ektachrome Film | Imacon 848 Scanner



Chapter 10

Cooking with Photoshop

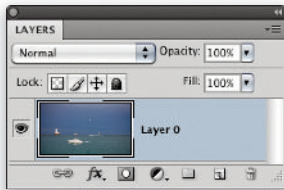
Taking your Photoshop skills to the next level

We are now ready to show you what you can do in Photoshop to push the boundaries a little and become a true Photoshop expert. As with some of the earlier techniques, it is not just about what you can do in Photoshop to enhance your photos – some of what we describe here, such as the Photomerge techniques, requires some planned shooting beforehand. The main message in this chapter is to show you just a few of the ways you can use Photoshop as your digital darkroom.

Moral rights

UK copyright law allows the copyright owner to assert what is known as their 'moral rights'. These include the right to be identified as the author of a work (although this must be asserted and is not automatic), plus the right to object to the derogatory treatment of a work. USA copyright law doesn't include this clause, but the 1990 Visual Artists Rights Act, 17 USC § 106A does give authors 'rights of integrity' which amounts to the same kind of protection against prejudicial distortion of a work.

1 Here you can see the original photograph shot of a harbor entrance. To prepare this photograph for content-aware scaling, I first needed to choose **Select ⇒ All** (**⌘ A** / **ctrl A**) to prepare the image for a content-aware scale transform. It doesn't matter if the image is flattened and has a Background layer or, as in this case, has a single normal layer.

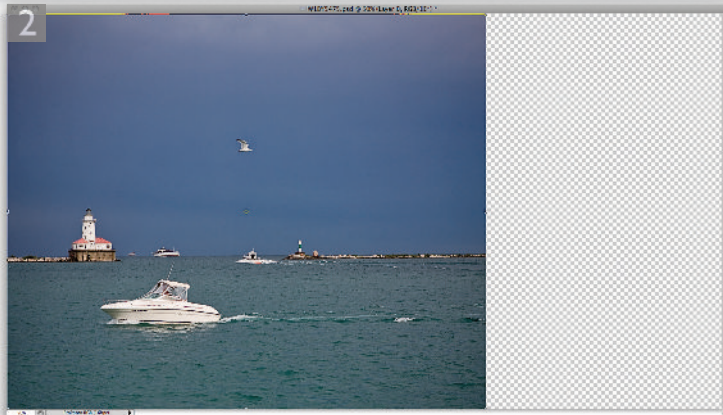


Content-aware scaling

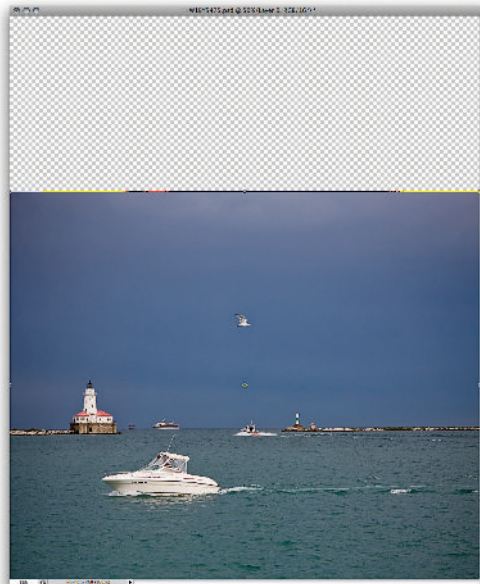
The Content-Aware Scale feature was arguably one of the more interesting, and some might say, controversial new features that was first added in Photoshop CS4. As you can see here, you can use content-aware scaling to radically adjust the aspect ratio of some photographs, but without squashing or stretching important subject matter within the picture. Yes, this may be a contentious tool if used inappropriately and without permission of the copyright holder, but we feel it may prove very useful to design and advertising photographers. For example, most ads and design layouts are required to fit several different aspect ratios such as posters, magazine layouts and web banners. This tool allows you to easily modify a single photograph to fit various aspect ratio layouts.



2 I then went to the Edit menu and chose Content-Aware Scale (or I could have used the **⌘ ⇧ C** / **ctrl alt Shift C** keyboard shortcut). This applied a bounding box to the image and allowed me to drag the right-hand side handle inwards to compress the picture horizontally. You'll notice in this screen shot how the content-aware scaling feature cleverly compressed all the soft areas of detail such as the harbor wall and the sea, while preserving the detailed subjects such as the lighthouse and boats.



3



3 After I had applied the first content-aware scale transform I selected the crop tool to apply a crop to the photograph where I dragged the top handle of the crop bounding box upwards and clicked OK, in order to add more canvas area to the top of the picture. I once more chose Edit ⇒ Content-Aware Scale so that I could apply a second transform to the photograph.

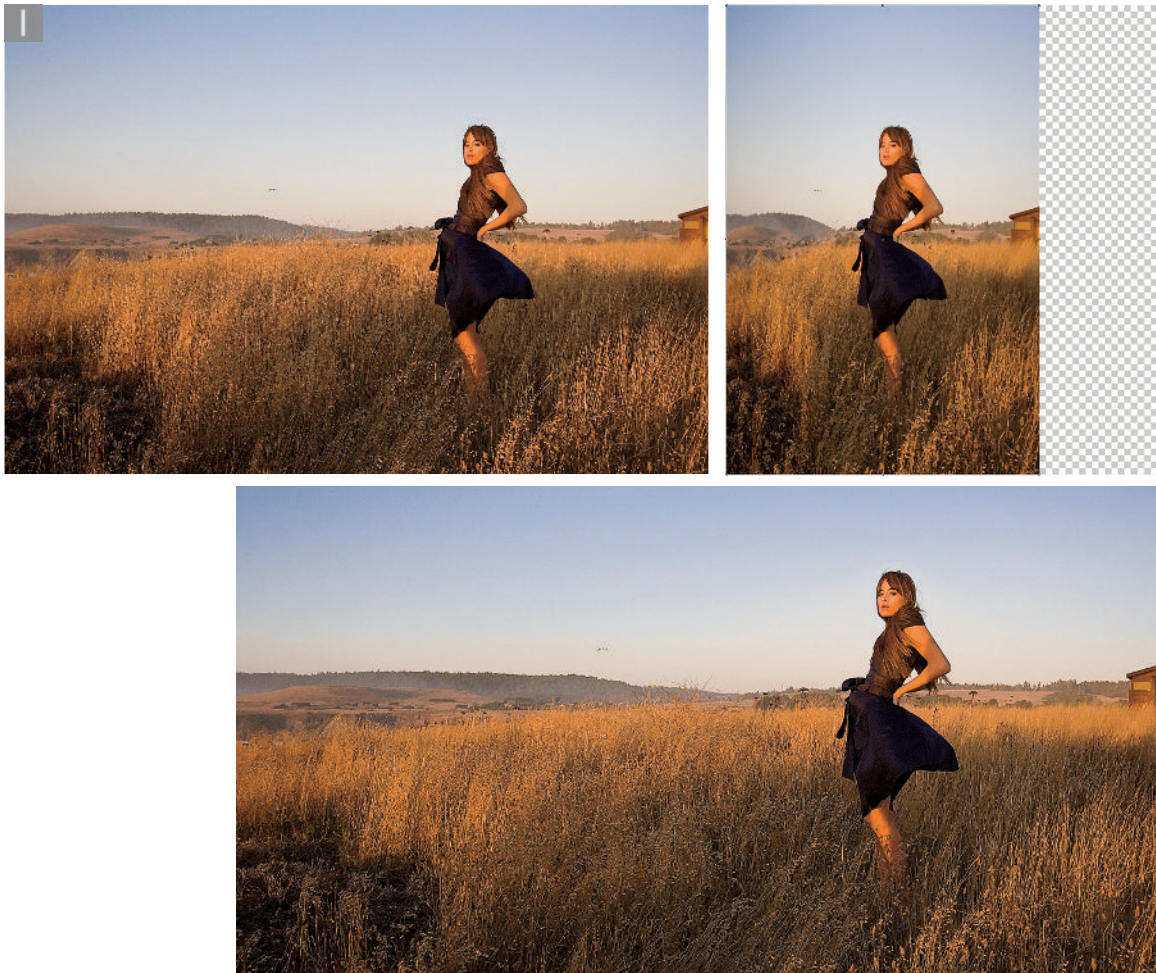
4



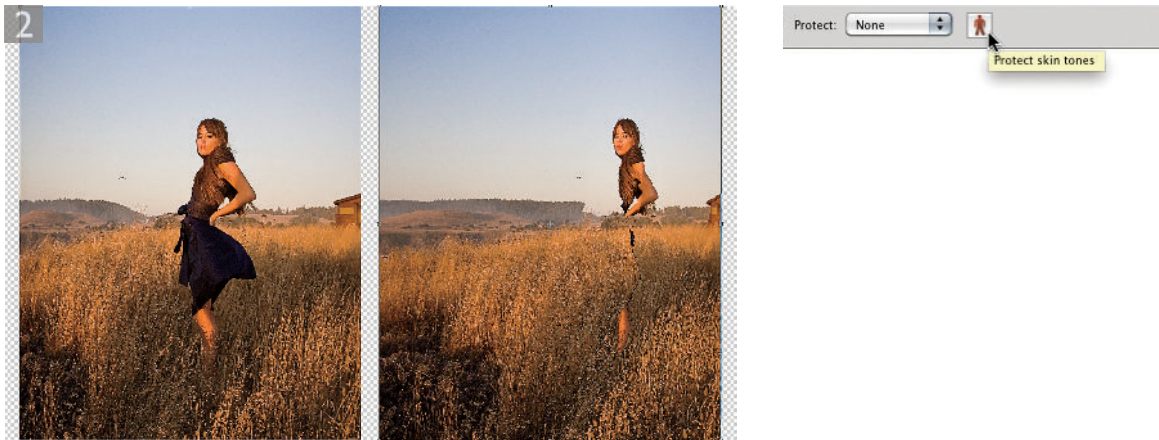
4 Here you can see the result of the second content-aware scale transform, in which I dragged the top handle of the transform bounding box upwards to make the image fill the full height of the picture. What is interesting about this feature is the way that the content-aware scale transform appears to automatically recognize objects where the shape needs to be preserved, while compressing or stretching the areas that are of less importance. You'll also notice in this example how the content-aware scale transform preserved the position of the horizon and stretched the sky only.

Content-aware scaling – another use

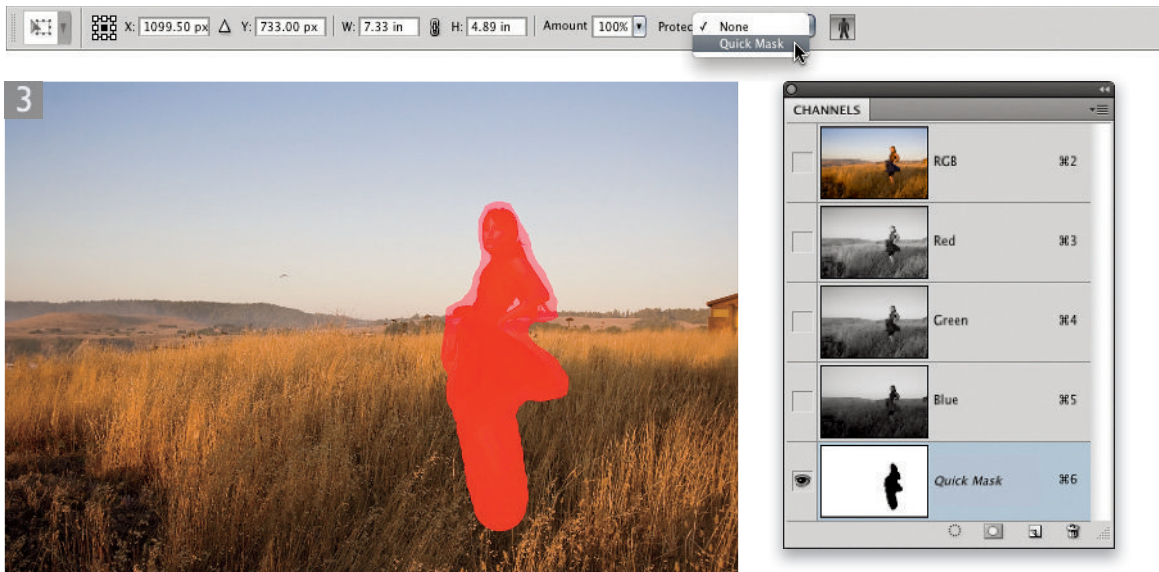
Even without resorting to masking, the Content-Aware Scale feature can do remarkable transforms. However, it can also be used to remove things (or people) from a scene. In the example below a horizontal image has been transformed into a strong vertical proportion. In the third step a mask is used to eliminate the model.



1 To prepare this photograph for content-aware scaling, I first selected all of the layer contents on the Background layer (**⌘ A** **ctrl A**) to target the image for transforming. I then went to the Edit menu and chose Content-Aware Scale (**⌘ ⇧ C** **ctrl alt Shift C**). I applied a normal content-aware scaling and was able to make the horizontal image into a vertical. I then tried making a wider image. That also worked well. These are both are examples of extreme scaling.



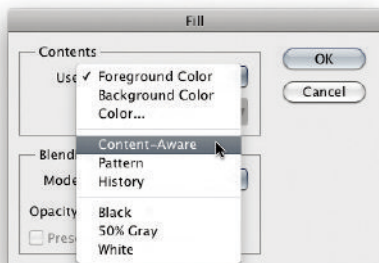
2 I wondered how the Protect skin tones option for protection would work on this image. I clicked on the option and as is often the case for full-length images, Protect skin tones did indeed protect the skin of the model, but not so much her body. The protected skin (above left) was clearly better than the unprotected skin tone option (above right).



3 Going back to the original image, I entered Quick Mask mode and created a rough outline using a hard-edged brush. This mask could be used to trigger content-aware scaling to squeeze this portion to remove it (more or less). So, after going to the Edit menu and choosing Content-Aware Scale, I selected the Quick Mask from the tool Options bar drop-down menu before applying the transform.



4 I dragged the transform handle on both the left and the right towards the middle. As is often the case when removing objects, a tiny remnant remained that required fixing. Now with Photoshop CS5's Content-Aware Fill, fixing such artifacts is less of a chore.



5 I used the marquee tool to select the area that needed the Content-Aware Fill. I then used the Fill command found in the Edit menu and selected Content-Aware from the drop-down menu.



6 When I zoomed in; I noticed a few things that Content-Aware Fill hadn't handled too well (above left). So, I used a combination of the healing brush and clone stamp to get rid of some of the duplicated shapes and other artifacts.



7 The last step was to crop off the building on the right because I found it distracting (personally, I actually like the shot with the model better, but this was a useful demo).

Digital darkroom effects

Advanced black and white conversion

Given the advances in the abilities of Camera Raw and Photoshop to do excellent black and white conversions, you might think that doing a manual conversion would be an anachronism. But there are times when a global conversion from color to black and white is less than optimal and this technique may prove effective. In order to understand the following approach it's important to understand that red, green and blue (RGB) images are, in fact, three flavors of black and white combined into a single composite image. The Red channel is the equivalent to being filtered by a Kodak Wratten 29 tri-color separation filter. The Green channel is a 61 while the blue is a 47. So with every RGB color image you already have three potential black and white conversions (the basis of this is what Photoshop's Black and White adjustment is based on). With a simple color to Lab conversion you can also access the Lightness channel, which brings the total to four (see Figure 10.1).



Figure 10.1 Above is the original RGB color image. Below are the Red, Green, Blue and Lightness channels that can be used for a black and white conversion.



The Red channel



The Green channel



The Blue channel



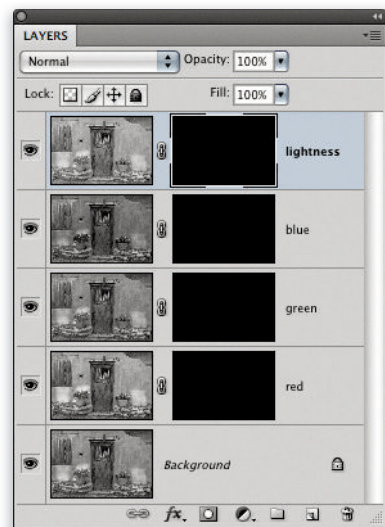
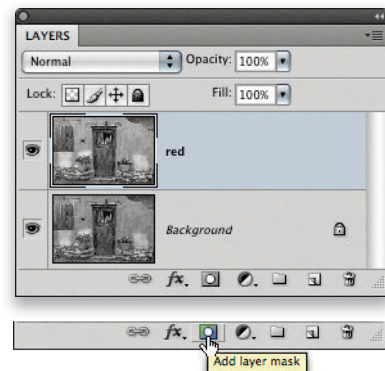
The Lightness channel

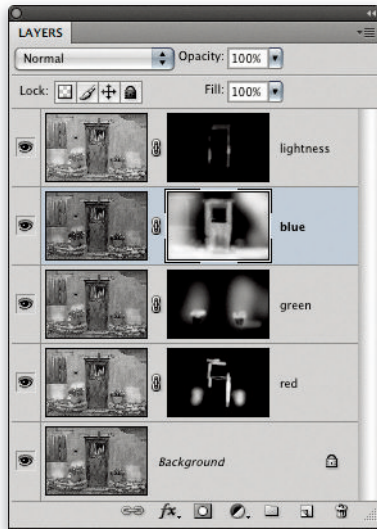


1 In this step I targeted the Red channel of the original color document (above left) and chose **Select** ⇒ **Select All** (**⌘ A** **ctrl A**). I then copied the channel to the clipboard (**⌘ C** **ctrl C**). In order to get the color channel information into a grayscale document I duplicated the original image (on the left) and converted the copy (on the right) to grayscale using the **Image** ⇒ **Mode** ⇒ **Grayscale** command.

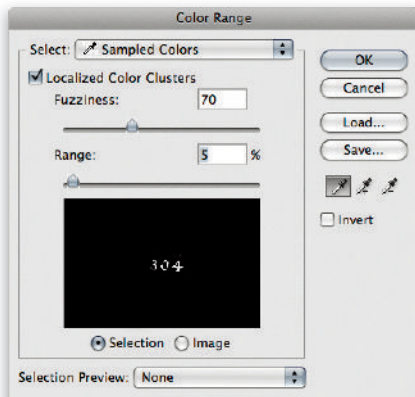


2 Next, I targeted the grayscale copy image and pasted from the clipboard (**⌘ V** **ctrl V**). This took what was the Red channel and pasted it as a grayscale layer. I named this the 'red' layer (so I could keep track of which channel the layer was from). I added a Hide All layer mask by holding the **⌘ alt** key and clicking on the new layer mask icon. I repeated the process for each subsequent channel/layer pairing including the Lightness channel. To get the Lightness channel I converted the RGB image to Lab using the **Image** ⇒ **Mode** ⇒ **Lab Color** command. From this point, it was merely a matter of deciding which layer had the best black and white image data on it and painting into the layer mask with white to make it visible. The layer stack shows the current Background layer, which is the Photoshop default grayscale conversion. For those interested, Photoshop's default conversion is a calculation based upon blending approximately 30% of the Red channel, 60% of the Green channel and 10% of the Blue channel. Using that as a basis, I could decide what percent of which channel would end up giving the optimal conversion – and the advantage is that I could do so locally with layer masks. But wait... there's more!





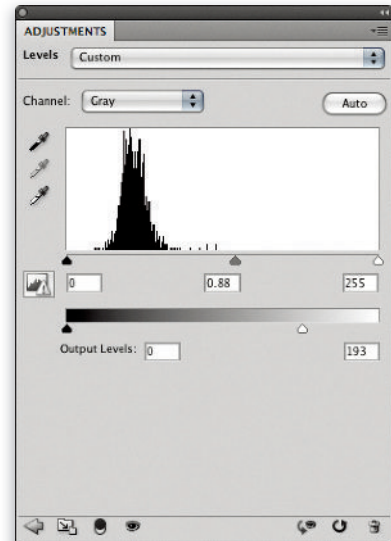
3 The image above had the final layer blending via layer masks shown in the layer stack. The one area where the layer blending failed to provide an optimum conversion was in the numbers on the door. Since I still had the color image open, I could use Select ⇨ Color Range to select the color of the numbers.



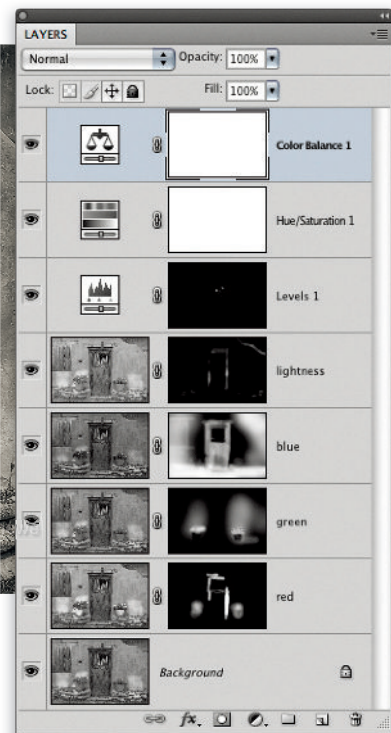
4 Using Color Range on the color image, I selected the door numbers. I used a high fuzziness setting and also used the Localized Color Clusters option (which first appeared in Photoshop CS4). With the selection active (left figure) I selected the marquee tool and started to drag the selection. Once I started the drag, I held down the **Shift** key before dropping the selection on the grayscale image (on the right). Holding down the **Shift** key instructs Photoshop to pin register the selection. Since the color and grayscale images had the exact same pixel dimensions, the selection was dropped exactly in the grayscale image where it started in the color image.



5 Using the selection of the numbers I added a Levels adjustment layer to darken the numbers in the image. As far as the color to black and white conversion is concerned I was done. However, the thing about black and white in the darkroom is that black and white wasn't really all about black and white, there was often color toning done to the silver gelatin print. The next and final step is done after reconvert the image from grayscale back to RGB to add color.



6 This is the final result. I added a Hue/Saturation adjustment layer set to the Colorize option and a hue of 49 (amber) and a Saturation of only 5. The top Color Balance adjustment was used to give the color a split toned look. Using the Highlights tone I adjusted the yellow/blue slider to -7 (warming) then used the Shadows tone to move the yellow/blue slider to $+7$ (cooling). This split tone is similar to the old sepia tone from the chemical darkroom.



Cross-processing

The cross-processing technique has long been popular among fashion and portrait photographers for distorting the colors in a picture and bleaching out the skin tone detail. There are two basic cross-processing methods: E-6 transparency film processed in C-41 chemicals and C-41 negative film processed in E-6 chemicals.

You can simulate cross-processing effects quite easily in Photoshop and do so without the risk of ‘overdoing’ the effect or losing important image detail. One simple way to cross-process an image is to use the Split Toning panel sliders found in Camera Raw working with a raw, a JPEG or a flattened TIFF image (see Figure 10.2). This is a fast and effective method and the Balance slider gives you that extra level of control whereby you can adjust the bias between the shadow and highlight coloring effects.

The technique that’s shown over the next two pages aims to replicate the cross-curve effect you typically get when using a



Figure 10.2 Here you can see an example of how to use the Split Toning sliders in Camera Raw to apply a color cross-processing effect to a raw or flattened TIFF image.

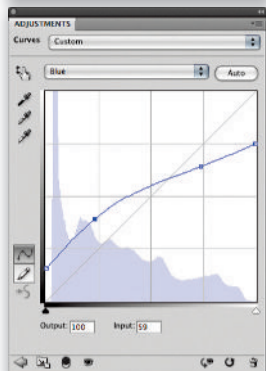
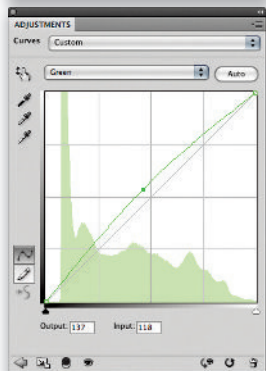
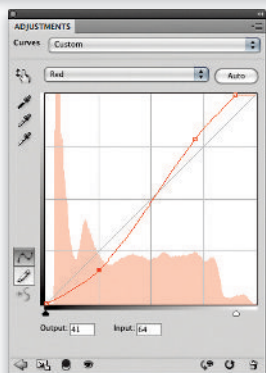
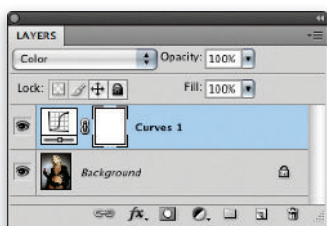
C-41 film processed in E-6. In this example you'll notice how I managed to make the shadows bluer and gave the highlights a yellow/red cast. This is a technique that I have adapted over the years so as to make it more flexible. As with all the other coloring effects described in this chapter, the main coloring adjustments are applied as adjustment layers using the Color blend mode. This helps preserve the original luminosity, but if you want to simulate the high contrast cross-processed look, then use the Normal blend mode instead. In addition to this, you might want to consider deliberately increasing the contrast in the RGB composite channel (this also boosts the color saturation). You may also wish to experiment with using different color fills and layer opacities.



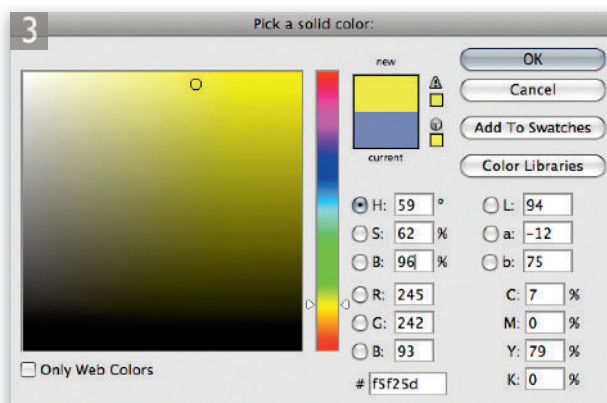
1 Here are the steps used to create a cross-processing effect that simulates C-41 film processed in E-6 chemicals. You can adapt this technique by using different channel Curve adjustments and different fill colors.

Luminance blending tip

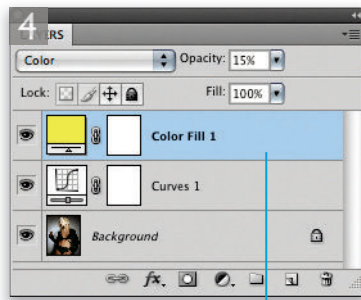
One way to preserve the luminosity in an image is to always set the 'coloring' adjustment layer to the Color blend mode. Some techniques described in this chapter involve a series of extreme image adjustments or multiple adjustment layers. Therefore, if you are not careful, you may lose important highlight and shadow detail. One solution to this is to make a copy of the original Background layer and place it at the top of the layer stack, and set the layer blending mode to Luminosity. This will produce the same result as setting a single adjustment layer to Color mode, but by adjusting the layer opacity of the duplicate layer in Luminosity mode you can restore varying amounts of the original image luminance.



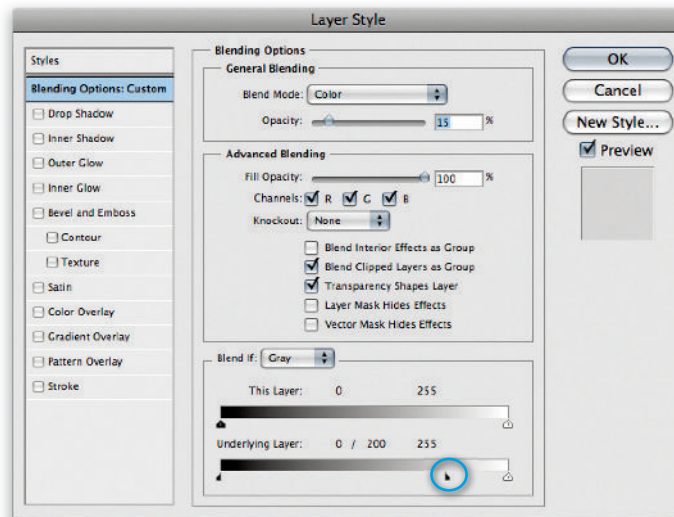
2 I added a Curves adjustment layer that used the Color blend mode and then adjusted the curves in the individual color channels as shown in the screen shots on the left. The Curves channel adjustments added a blue/cyan cast to the shadow areas and a red/yellow cast to the highlights. Because the Curves adjustment layer was set to the Color blend mode, the luminosity was unaffected.



3 I then added a Color Fill layer (which was also set to Color mode), set the opacity to 15% and selected a strong yellow fill color.



Double-click in this area of the layer to open the Layer Style dialog.



4 I then double-clicked the Color fill layer and adjusted the Underlying Layer blend options. I **alt**-clicked on the Underlying Layer shadow point triangle slider and dragged to separate the dividers, splitting them in two, and dragged the right-hand shadows slider (circled) across to the right.

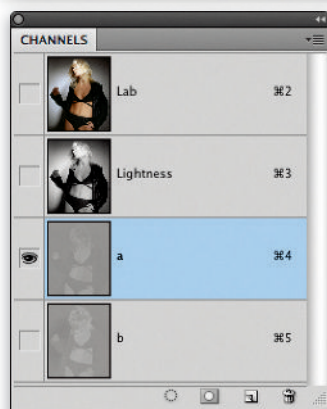
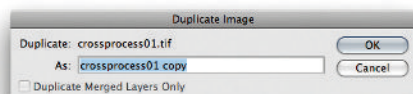


5 Here you can see the finished result in which I had created a transitional blend between the underlying layers and the yellow Color fill layer above.

Lab Color effects

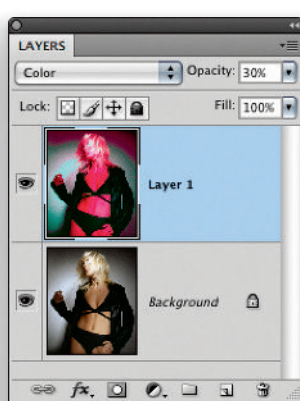
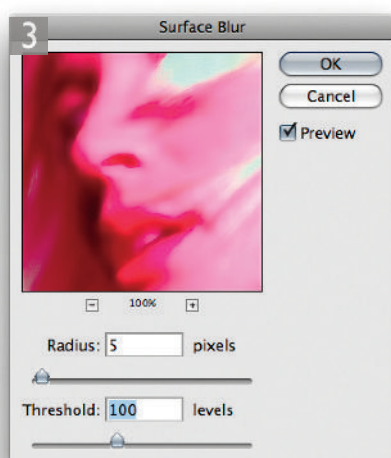
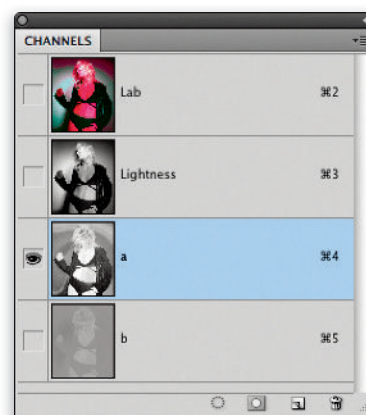
Here is another type of Photoshop cross-processing effect which involves making use of the Lab Color mode to distort the colors in a photograph. This is not a cross-processing effect per se, but this technique can certainly allow you to mess with the colors in your images in some pretty interesting ways. I would suggest that this effect is best applied to medium or high resolution images and that the source image should be fairly free of artifacts. As you will see at the end of this tutorial in Step 7, I found that you can also create some interesting variations if you invert the layers that are used to create the coloring effect.

1 To start with I opened an RGB image and created a duplicate copy by choosing Image ⇒ Duplicate... I then converted the duplicate image to Lab Color mode by choosing Image ⇒ Mode ⇒ Lab Color. The Lab Color image contained a Lightness channel plus **a** and **b** color channels. I went to the Channels panel and selected the **a** channel first.



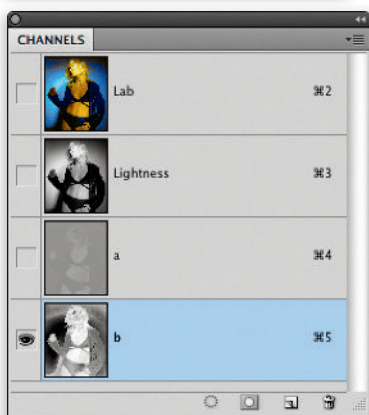
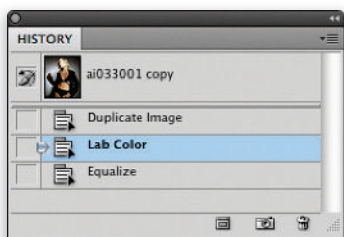


2 I then chose Image ⇒ Adjustments ⇒ Equalize, which expanded the channel contrast of the **a** channel. Next, I clicked on the Lab composite channel in the Channels panel (it is essential you remember to do this so that all three channels are selected again) and copied the enhanced image across to the original image as a new layer. You can do this by choosing Select ⇒ All, then copy and pasting the image contents. Or, you can select the move tool and drag the Lab image across to the original RGB version image. Make sure that you hold down the **Shift** key as you do so, as this ensures that the layer is centered when you let go of the mouse (there is no need to worry about the color mode mismatch: Photoshop automatically converts the image data back to RGB mode again as you copy it across). I set the blend mode for the Lab copied layer to Color and set the layer opacity to 30%.

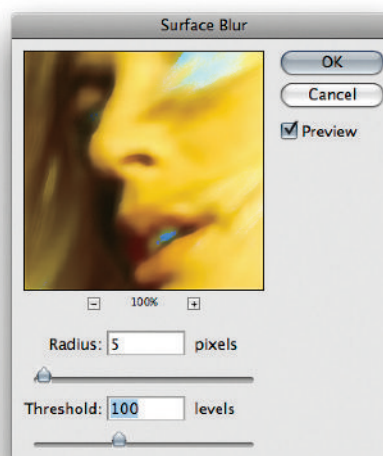


3 This Lab coloring technique can sometimes generate ugly pixel artifacts, so I chose Filter ⇒ Blur ⇒ Surface Blur and applied a 5 pixel Radius blur using a Threshold of 100 levels. This blur filter treatment softened the image, of course, but because the new layer was added using the Color blend mode, the blur simply smoothed the color information on this layer and this had no adverse effect on the detail, since it did not alter the luminance.

4 I returned to the Lab copy image and went back one step in the History panel to the point where I had just converted the duplicate image to Lab mode. I now selected the **b** channel and once again applied an equalize image adjustment and copied the newly enhanced composite Lab image across to the original RGB version of the image.

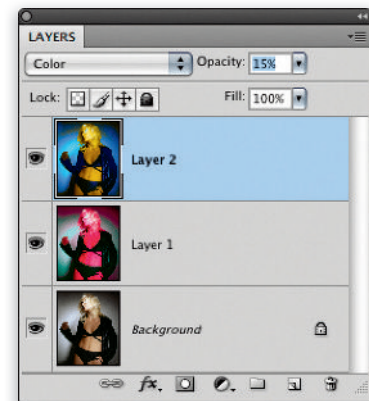


5 The new layer appeared as Layer 2 in the layer stack and I once more set the blend mode to Color and the opacity to 30%, and applied the same Surface Blur filter treatment to the newly added image layer.

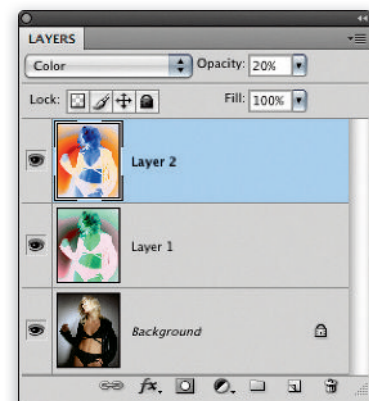




6 Here is the finished result. As you can see, when using the Lab Color cross-process method you end up with two brightly colored, semi-transparent layers. The fun starts when you adjust the relative opacity of each of these two layers to obtain different coloring effects.



7 In a further twist, I applied an Image ⇒ Adjustments ⇒ Invert adjustment to both of the coloring layers. This allowed me to produce an interesting color variation.



Black and white infrared film

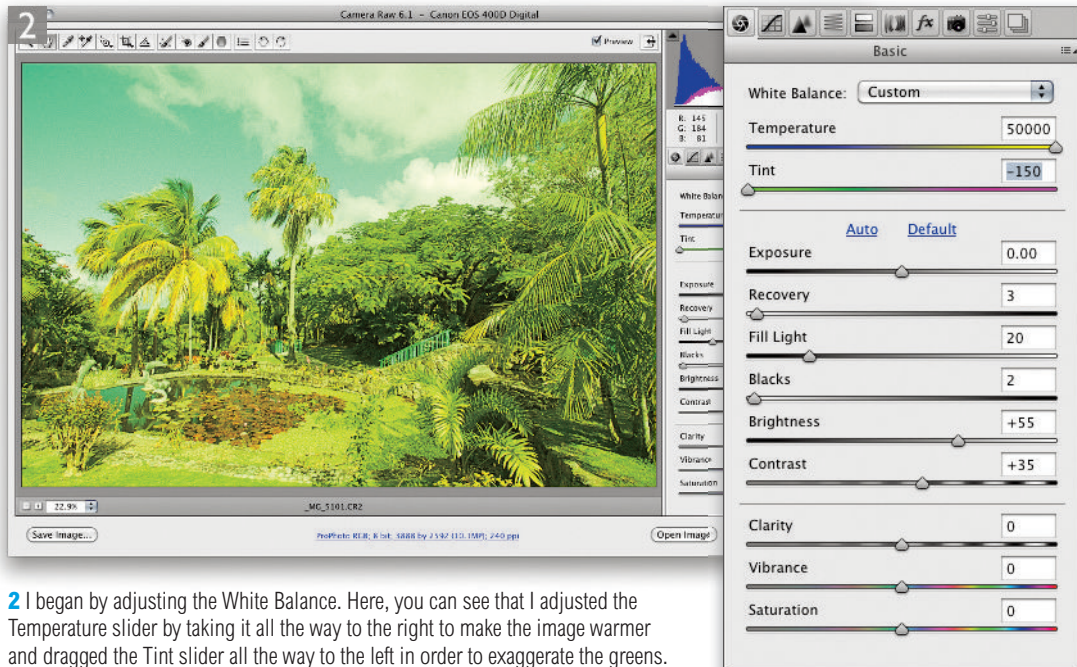
Black and white infrared film emulsions are predominantly sensitive to infrared radiation. Vegetation in particular reflects a lot of infrared light, which is beyond the scope of human vision. Hence, green foliage will appear very bright and almost iridescent when captured on black and white infrared film.

Simulating the black and white infrared look

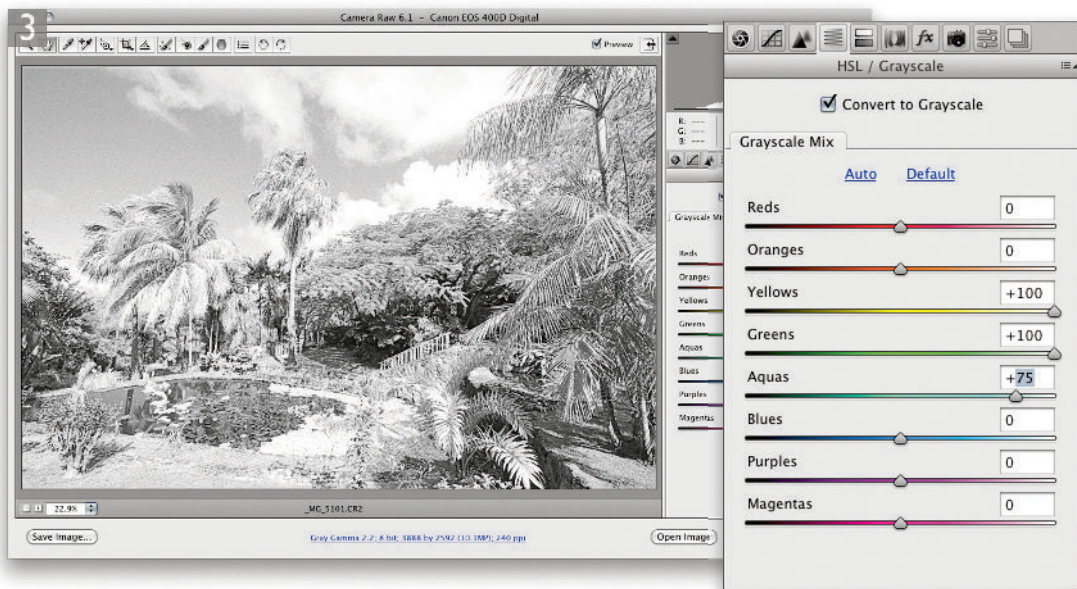
I first invented the black and white infrared technique some 10 years ago when I was asked to come up with different ways to convert a color image to black and white. I initially started out with a Photoshop method, which relied on the use of a Channel Mixer adjustment to boost the Green channel in the grayscale mix. Since then I have had the opportunity to make various improvements and more recently I have found that the Lightroom and Camera Raw approach now offers the best approach when creating the black and white infrared look. This is especially true now that you can apply a negative Clarity adjustment, which simulates the soft glow look that is so typical of black and white infrared photography. The following steps were all carried out using a raw capture file. To get the best results I suggest you work with a raw original, but you could use the same steps described here to process a JPEG or flattened TIFF image.



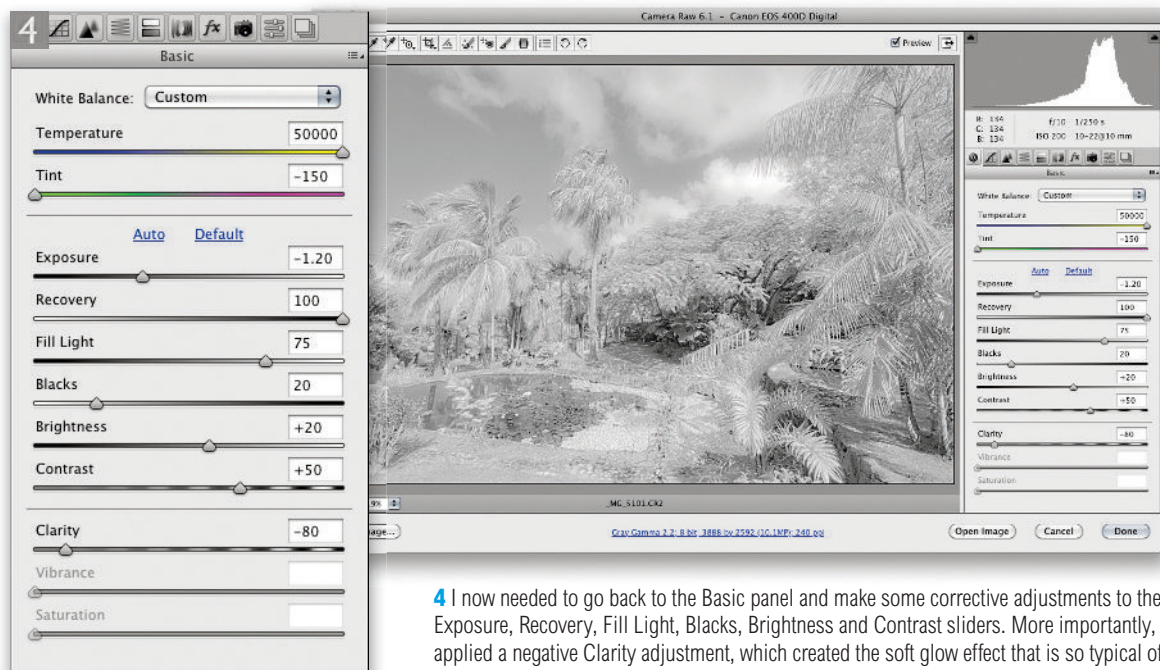
1 I chose this particular photograph to work with because it contained a lot of green foliage and was therefore an ideal subject for the black and white infrared treatment.



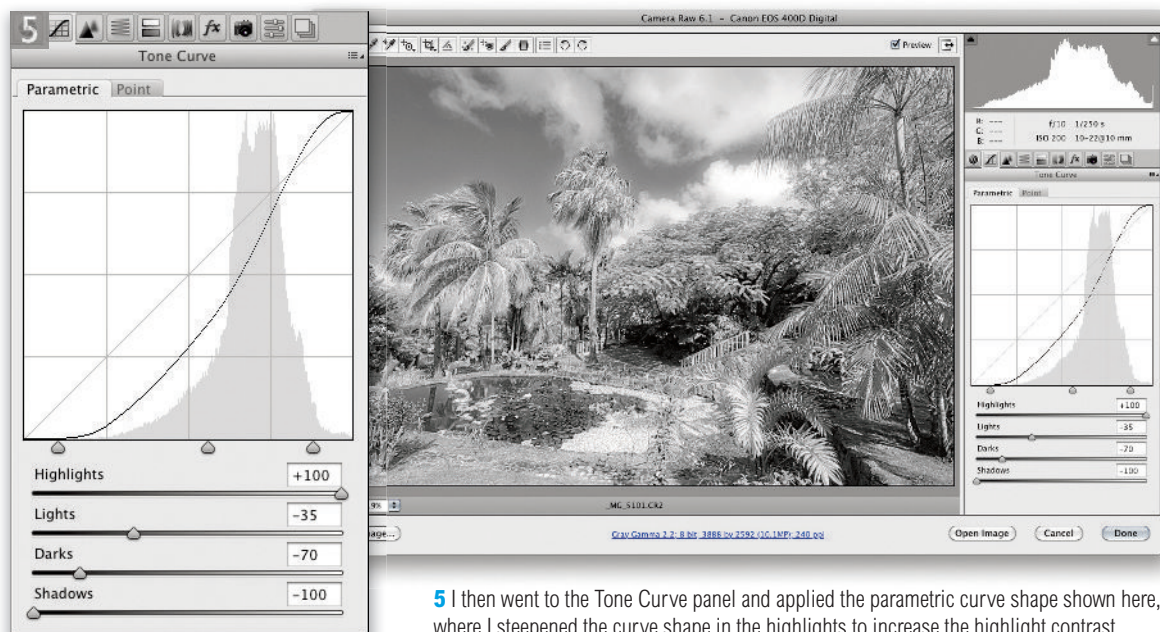
2 I began by adjusting the White Balance. Here, you can see that I adjusted the Temperature slider by taking it all the way to the right to make the image warmer and dragged the Tint slider all the way to the left in order to exaggerate the greens.



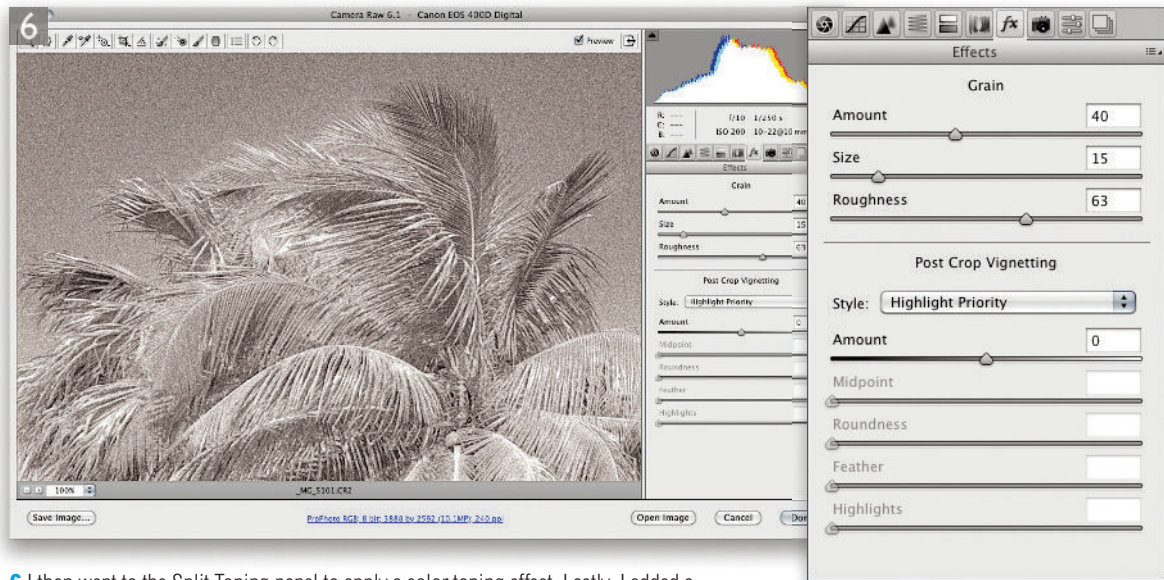
3 I then went to the HSL/Grayscale panel and checked the Convert to Grayscale box. I applied a manual Grayscale Mix adjustment, where I raised the Yellows and Greens to +100 and set the Aquas to +75. This lightened the green, yellow and aqua colors.



4 I now needed to go back to the Basic panel and make some corrective adjustments to the Exposure, Recovery, Fill Light, Blacks, Brightness and Contrast sliders. More importantly, I applied a negative Clarity adjustment, which created the soft glow effect that is so typical of black and white infrared photographs.



5 I then went to the Tone Curve panel and applied the parametric curve shape shown here, where I steepened the curve shape in the highlights to increase the highlight contrast.



6 I then went to the Split Toning panel to apply a color toning effect. Lastly, I added a grainy infrared film look, using the Grain sliders in the Effects panel.



7 This shows the final photograph, which was cropped slightly in Photoshop.

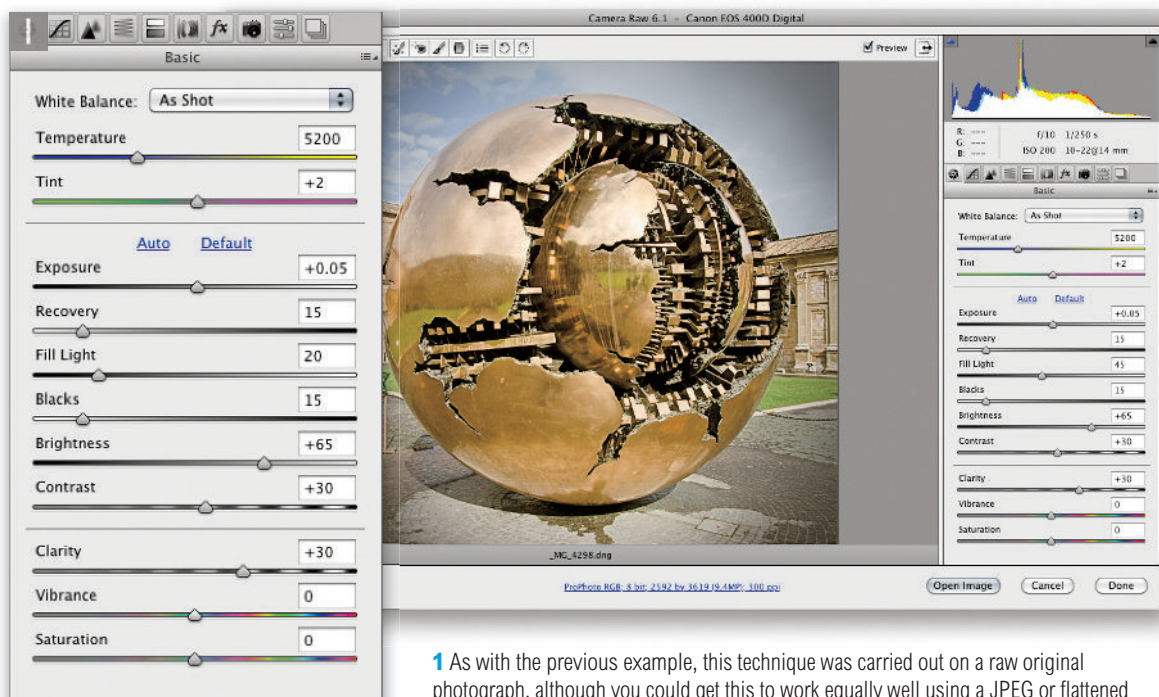
Origins of solarization

In this original photographic darkroom technique, associated with the artist Man Ray, the print paper is briefly fogged towards the end of its development.

Black and white solarization

Here is another Photoshop technique that has evolved into one that can now be done using Camera Raw. Ideally, you should use this method to edit raw originals, but it can also be made to work with JPEGs or flattened TIFFs.

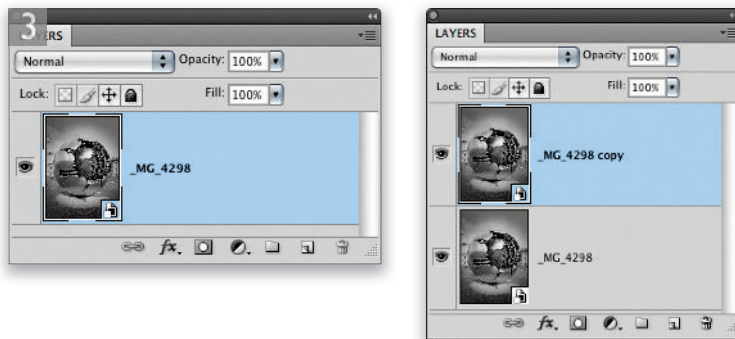
The original Photoshop method was quite simple: you applied a Curves adjustment, clicked on the pencil button to switch to draw mode and created an inverted V-shaped curve. The Camera Raw method is similar. In the example shown here, I went to the Point curve editor in the Tone Curve panel, added three points to the curve and dragged the top right point down to the bottom right corner. This allowed me to create the inverted 'V' shape shown in Step 4. The best thing about using Camera Raw to solarize an image is that when you revisit the Basic panel you can readjust the main sliders there and this allows you to further modify the solarization effect. You will notice here that I opened the Camera Raw processed image as a Smart Object, which allowed me to create two versions of the original master and then blend the two together using a pixel layer mask.



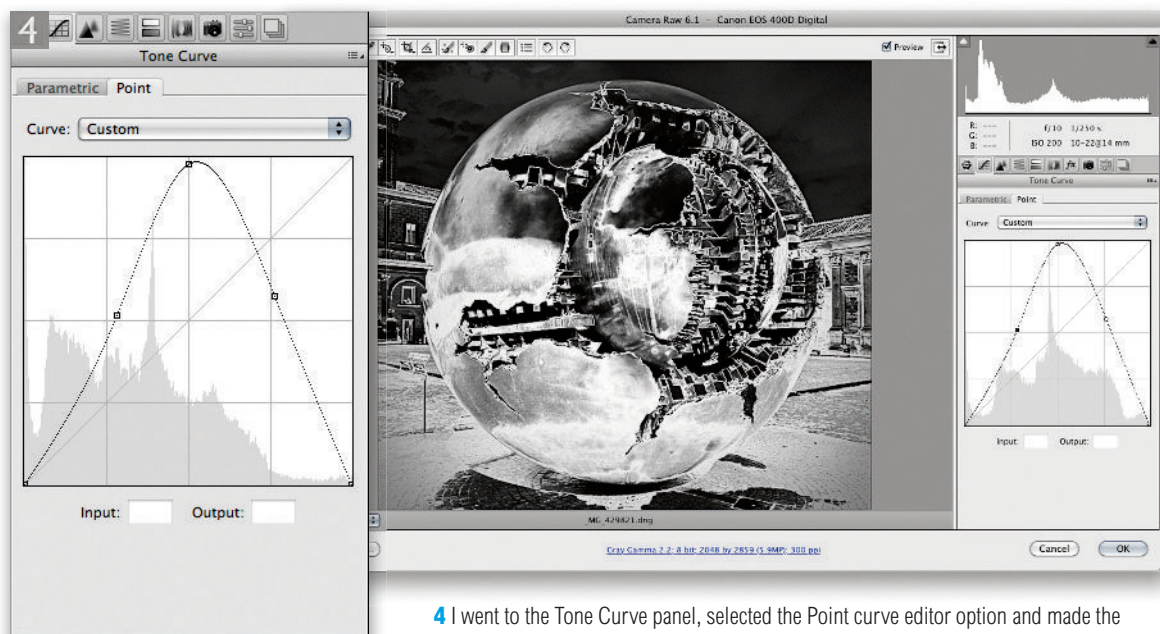
1 As with the previous example, this technique was carried out on a raw original photograph, although you could get this to work equally well using a JPEG or flattened TIFF image.



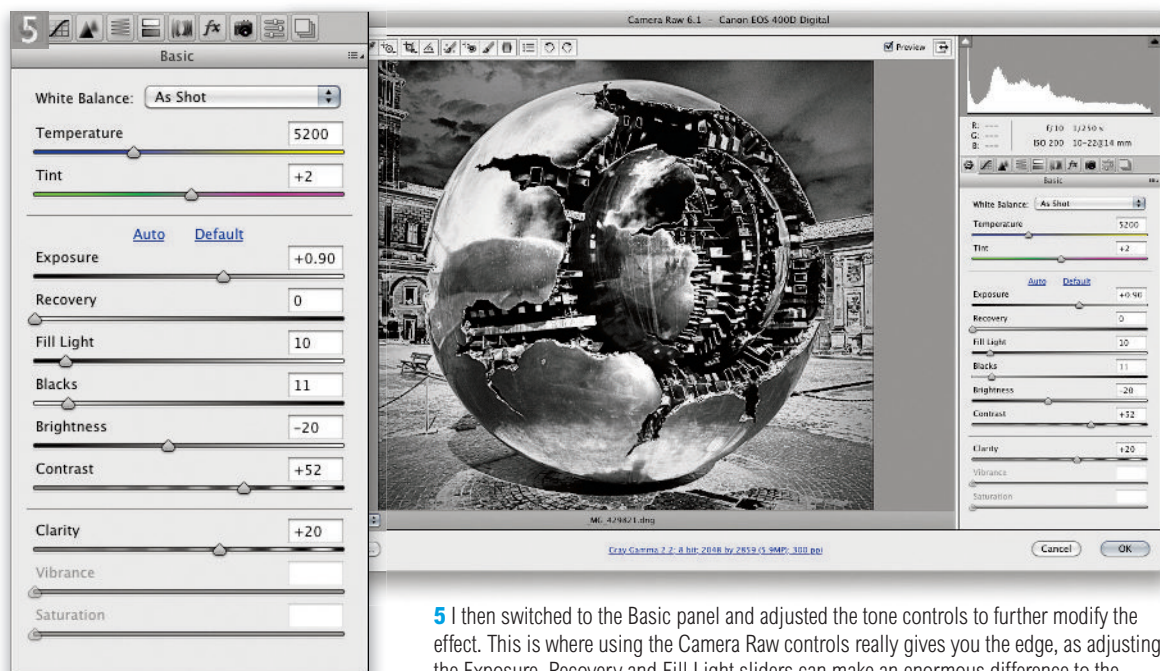
2 I began by converting the photograph to black and white and adjusted the HSL/Grayscale and Basic panel settings to achieve an optimum grayscale image from the color original. When I was happy with these settings I held down the **Shift** key to change the Open Image button to Open Object and clicked to open the photo as a Smart Object in Photoshop.



3 On the left is a Layers panel view of the Camera Raw Smart Object layer. I made a copy of this layer by going to the Layer menu and choosing Smart Objects ⇒ New Smart Object via Copy. Note that you can also access this menu item by right-mouse clicking on the Smart Object layer and selecting New Smart Object via Copy from the contextual menu (Mac users who don't have a two-button mouse will have to hold down the **ctrl** key to access this menu). I made sure that the copy Smart Object layer was now selected so that the following steps were applied to this layer only.



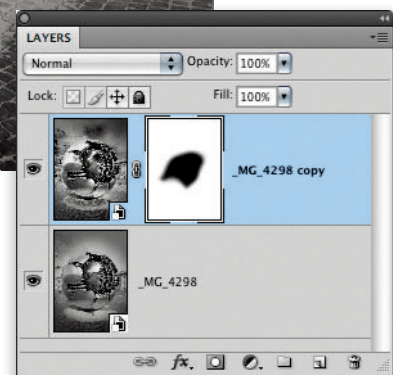
4 I went to the Tone Curve panel, selected the Point curve editor option and made the inverted 'V' curve shape you see here to create the solarized look.



5 I then switched to the Basic panel and adjusted the tone controls to further modify the effect. This is where using the Camera Raw controls really gives you the edge, as adjusting the Exposure, Recovery and Fill Light sliders can make an enormous difference to the solarized effect. Note also that the behavior of these sliders is different in CS5.



6 At this stage I now had two Smart Object layers of the same source image in the Layers stack. I had processed the lower Smart Object layer as a normal black and white conversion and had processed the upper layer using the solarized settings shown in Steps 4 and 5. I added an empty pixel layer mask to the upper layer, and painted on the mask with black as the foreground color to hide portions of the solarized version and reveal the non-solarized version on the layer below. A further benefit of the Camera Raw Smart Object approach was that I could continue to edit the individual Camera Raw settings on each of the Smart Object layers.



Coloring an object

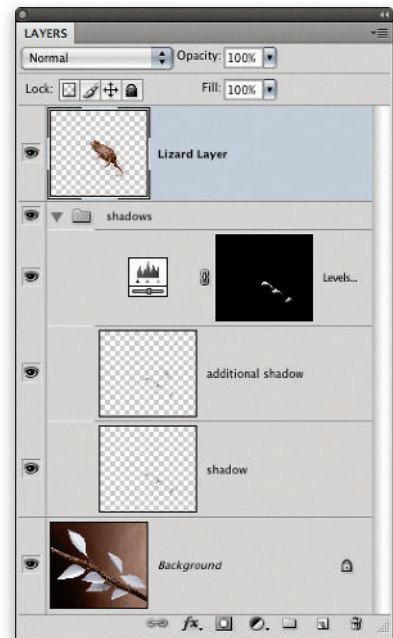
It's not at all unusual for the color of things to be wrong even when the overall color is fine. So, the ability to alter or add color to an object is useful. In this case the image was prepared for a paper company that wanted to promote themselves as 'chameleons' in the paper biz (hey, we don't get to control the ad concepts). So the mandate was to use examples of their paper: fine writing paper, cardboard and even brown wrapping paper, and a chameleon. So, I hired a chameleon wrangler, made a model with paper and did the shots to combine. When working with animals, I've found it's a really good idea to want the animal to do what it does naturally (it's real hard to keep it from what it wants to do). For this assignment I shot the chameleon first, made the image pick and built the set around where the chameleon would be placed, as shown in Figure 10.3. The coloring on the lizard would be done in Photoshop.



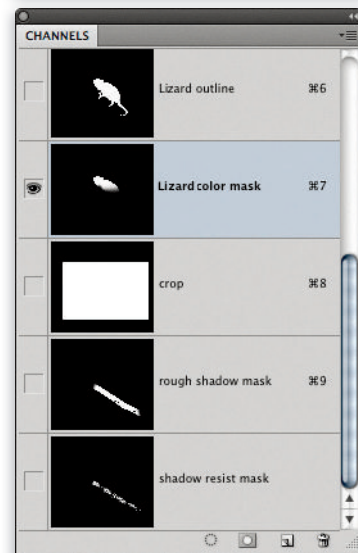
Figure 10.3 These are the scans of the original 4 x 5 film shots. The chameleon's name was Fred and when placed on the set naturally he assumed the color of the cardboard (which was a good thing because he was green when he was first removed from his box and that would have been more work to fix). The figure on the right shows the set that was built after picking the main image. The 'leaves' were placed strategically to allow putting Fred on the 'branch'.

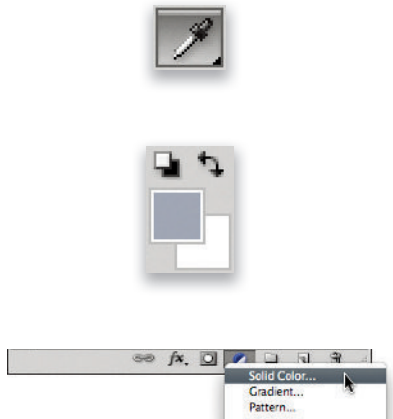


1 The first step was to composite the lizard (Fred) in place. Well, actually there were a lot of steps prior to getting to this stage such as creating a path around Fred and various retouching done on the two scans. But this is where we're starting from here. The layer stack shows the three layers that made up the shadows plus Fred.

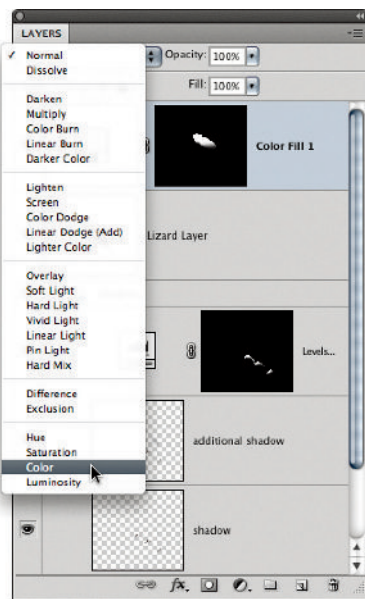


2 The next step was to create the channels. The path of the chameleon was turned into a selection and saved to make the channel on the left. The channel was duplicated and the channel on the right was hand painted to reveal only the areas where the color would be added later.





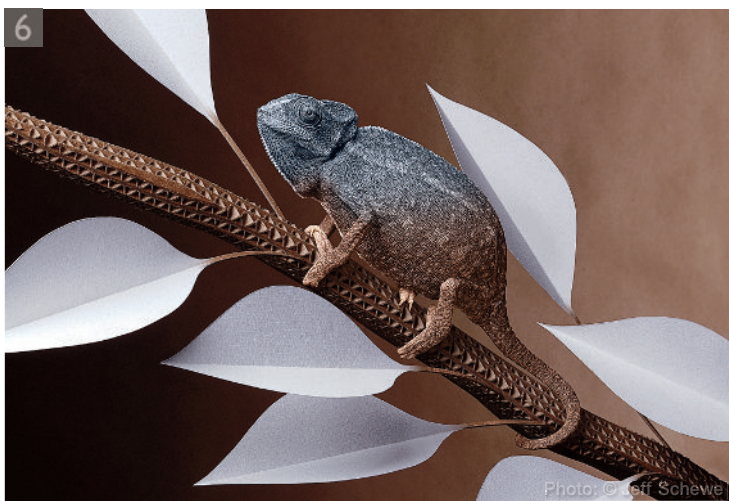
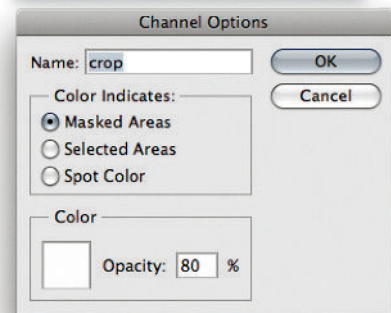
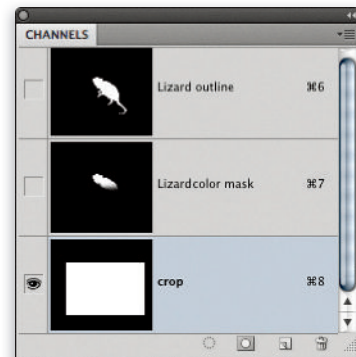
3 The Lizard color mask channel was loaded as a selection using **Select ⇒ Load Selection** and the eyedropper tool was selected to choose the color to fill. The client wanted to use a color close to the writing paper so I sampled an area to arrive at the color. I then added a Solid Color fill layer from the layers panel icon using the foreground color that had just been selected.



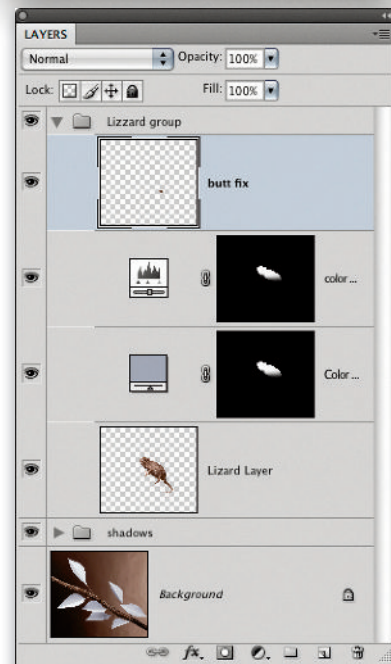
4 The color fill layer's blending mode needed to be set to Color to only alter the color of the underlying image. The color blend mode contains both the hue and the saturation information (it's actually a combination of both) but not luminance. Filling (or painting) using a color blend is the trick to changing the color of an object. You can do it radically as in this example or you can paint or fill it in with a low opacity for more subtle effects.



5 Here the color fill had been accomplished. A slight Levels adjustment layer was put on top to tweak the color of the fill. This step shows a trick I use when dealing with art directors who have a habit of changing their minds (and sometimes the layout): non-destructive cropping. Rather than actually crop the image pixels (until the last moment), I used a channel with the channel options set to a Color of white and an 80% Opacity (sometimes it's at 100%). The advantage is you can see the whole image and the live area but only crop at the end. You can even transform the size and the location (don't rotate – that doesn't work) then simply load the crop channel as a selection and choose Image ⇒ Crop.



6 This shows the final composite, coloring, crop and butt fix. Fred had an 'issue' that had to be addressed by retouching on a separate layer.



Coloring effects using Match Color

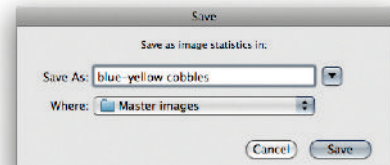
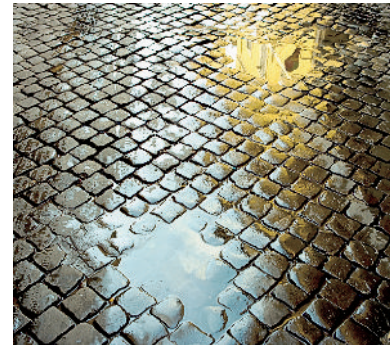
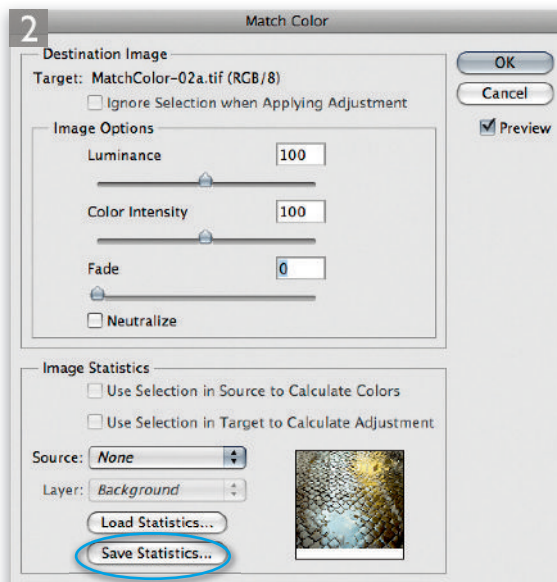
The Match Color adjustment is available from the Image Adjustments menu and is mainly designed to allow you to match the colors in one image with those in a source image. For example, if you have two separate shots of an important product where the colors need to match, you can use Match Color to get these to match exactly. However, you can also use the Match Color adjustment in a creative way to sample colors from a source image, and apply these to other, completely different photos. This technique can produce interesting and sometimes unusual-looking results.

In Step 2 you will notice that I used the Equalize command to balance out the Match Color sample image before I saved the statistics. This can help you achieve a statistics file that can be used as a colorize adjustment, but without disrupting the tonal balance of the destination images. However, you may still need to make further adjustments in the Image Options section, using the Luminance, Color Intensity and Fade sliders.

If you are interested in using this technique then you might perhaps consider creating a library of Match Color statistics settings. Open up a bunch of images and save out different Match Color settings which you can then use on other images.

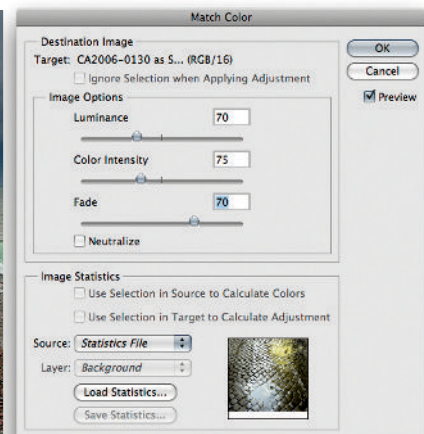


1 To demonstrate the following technique, I opened a photograph where the colors in the original scene were fairly muted.



blue-yellow cobbles.sta

2 Next, I needed to create a Match Color settings file. To do this, I opened the sample image shown on the right and chose Image ⇒ Adjustments ⇒ Equalize. This step was done to ensure that the tones ended up more evenly distributed. You don't have to apply this step, but it can help you produce a better Match Color statistics file. I then chose Image ⇒ Adjustments ⇒ Match Color and clicked on the Save Statistics... button (circled) to save this as a Match Color statistics setting.



3 I opened the image shown in Step 1, chose Image ⇒ Adjustments ⇒ Match Color again, then clicked on the Load Statistics... button and selected the previously saved Match Color setting. I then fine-tuned the Match Color settings. I set the Luminance to 70%, the Color Intensity to 75% and the Fade to 70% and clicked OK to apply the adjustment.

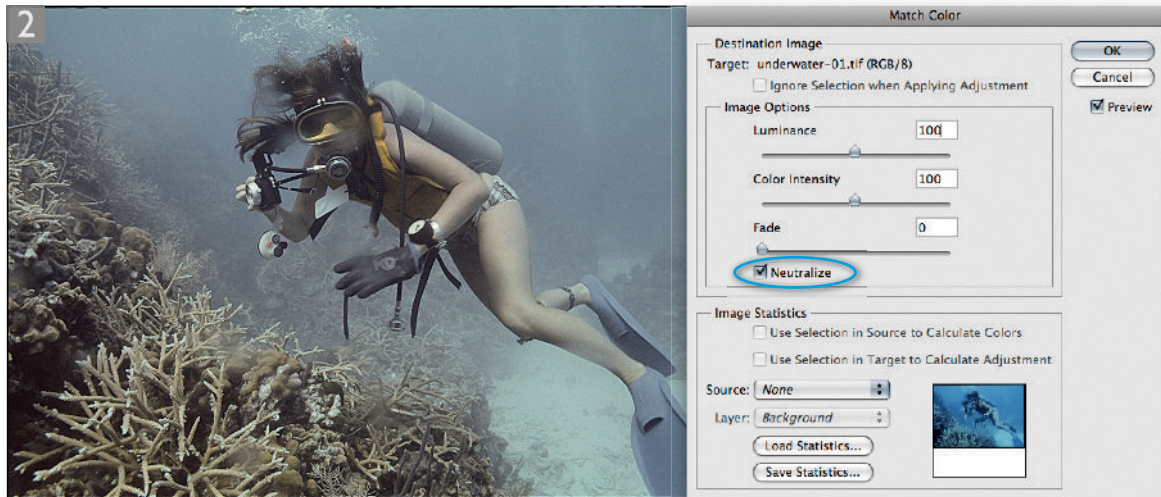
Match Color auto adjustments

The Match Color image adjustment can also function as an auto color correction tool for images that have a heavy color cast.

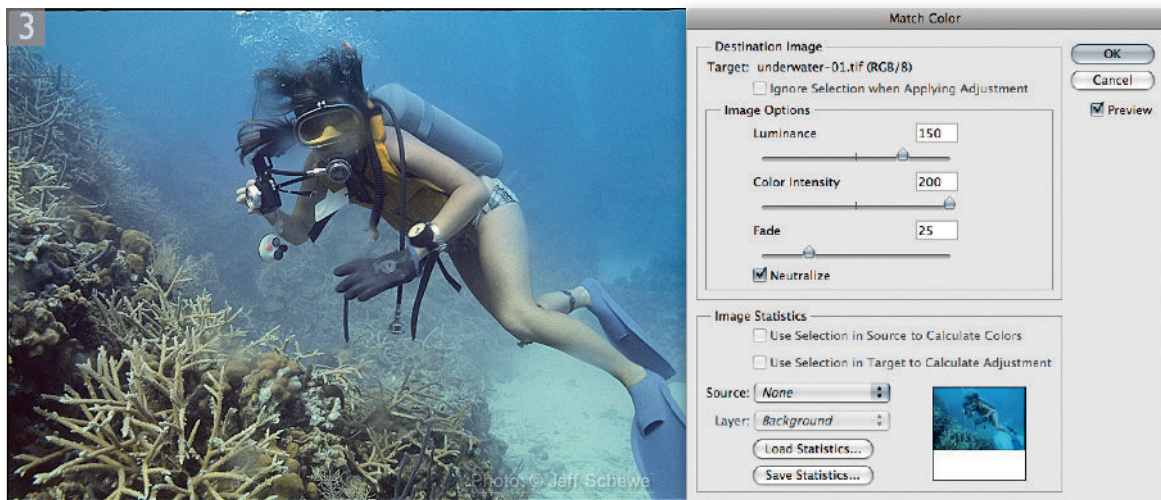
In the following tutorial you'll see how Match Color can be very effective at removing a deep blue/cyan cast from an underwater photograph. You can always try using the Image ⇨ Adjustments ⇨ Auto Color adjustment in Photoshop to remove such casts, but Match Color's ability to neutralize tricky subjects is usually more impressive. It's not just the fact that a Match Color neutralize is generally more effective, you also have the ability to use the Image Options sliders to moderate a Match Color neutralize adjustment. For example, if you use Match Color to auto-correct images with heavy casts this can result in images that have less overall saturation. You may therefore sometimes want to adjust the Color Intensity in the Match Color Image Options section in order to compensate for the lost saturation. In addition to this you can adjust the luminance of the image and fade the overall adjustment.



1 The Match Color image adjustment is a useful image correction tool in its own right. In this extreme example, I used the Match Color adjustment to remove the strong blue/cyan cast seen in this photograph taken by Jeff in his scuba diving days!



2 To do this, I went to the Image menu, chose Adjustments ⇒ Match Color and checked the Neutralize option (circled). This helped remove most of the color cast in the photograph.



3 Step 2 did quite an impressive job of removing most of the deep blue color. However, I felt that it would be useful to moderate the adjustment slightly. First of all, I raised the Luminance to +150%, which essentially lightened the photo. Since the photograph had now been neutralized, there wasn't an awful lot of color saturation left in the image, so for this reason I raised the Color Intensity to +200%. Lastly, I moved the Fade slider slightly to the right in order to fade the neutralize adjustment and restore a little more of the original color. The final result is a picture that still looks like an underwater photograph, but with more of a neutral color feel and perhaps a little closer to how Jeff perceived the original scene when he shot this picture.

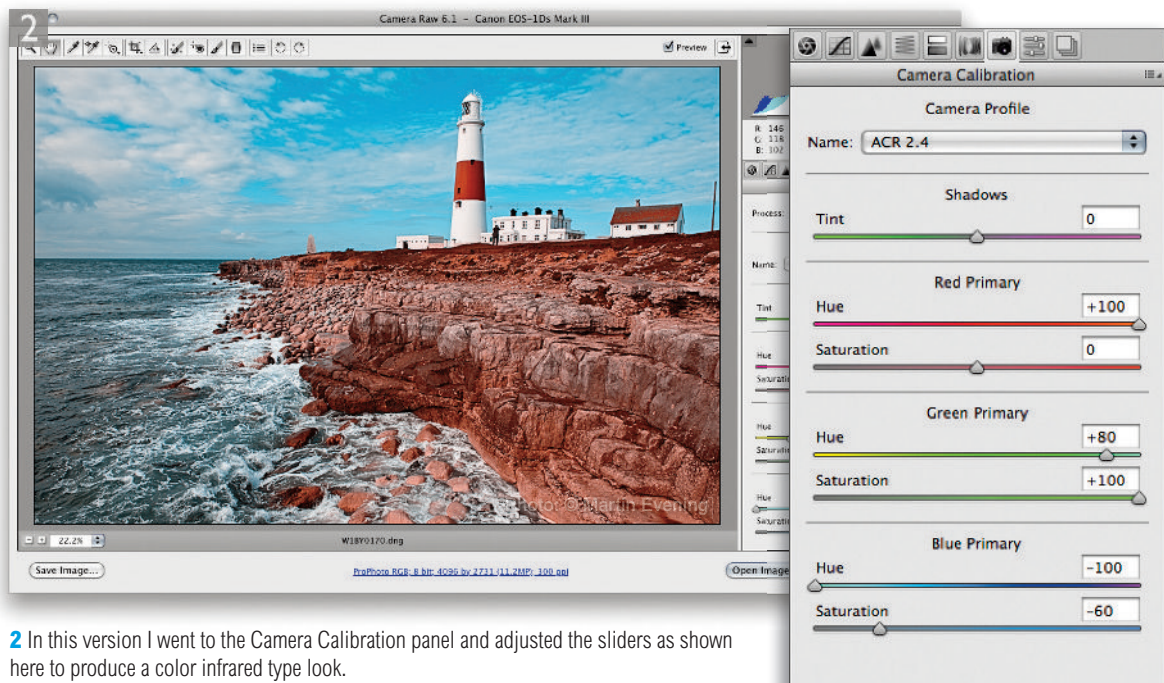
Using Camera Calibration to distort colors

The Camera Calibration panel in Camera Raw is really intended for fine-tuning the color calibration of a camera and getting the Camera Raw processed colors to match as closely as possible to the colors in the original scene. However, one of the interesting things you can also do with the Camera Calibration panel is to deliberately mess up the colors in an image to create unusual color effects.

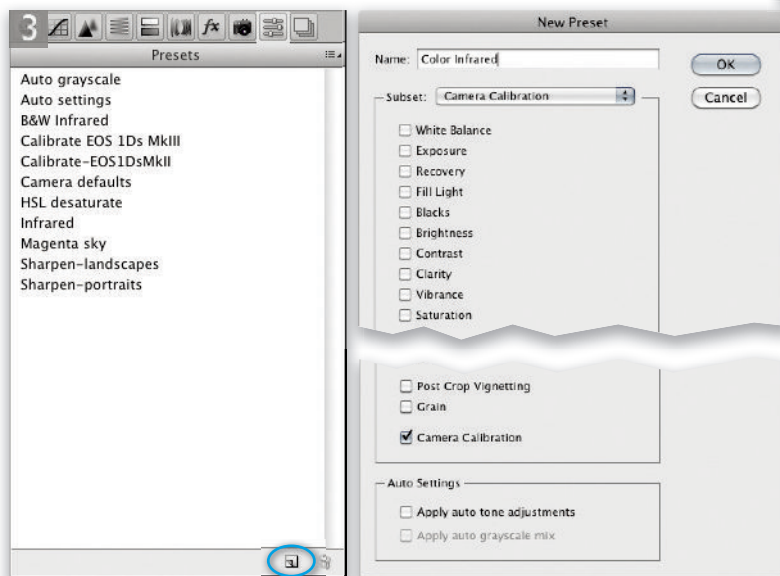
To achieve the result you see here I mostly adjusted the Hue and Saturation sliders in the Camera Calibration panel, taking the sliders to their extremes. If you want, you can link these adjustments with further modifications to the Temperature and Tint white balance sliders in the Basic panel, not to mention the Split Tone panel controls as well. Once you find a calibrate setting that you are happy with and would like to reuse on other images, it is a good idea to save this as a custom setting.



1 This shows a normal version of a raw image that had been opened up in Camera Raw, where all I had done so far was to set a custom white balance in order to achieve neutral-looking colors and had adjusted the other settings to achieve a corrected tone balance.



2 In this version I went to the Camera Calibration panel and adjusted the sliders as shown here to produce a color infrared type look.



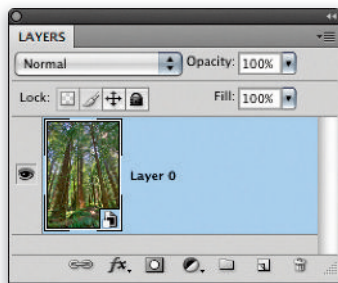
3 Once I was happy with the Camera Calibration adjustment I clicked on the Presets panel and then clicked on the New Preset button (circled) to save the setting as a Camera Calibration only preset, which could be accessed again in the future.

Softening the focus

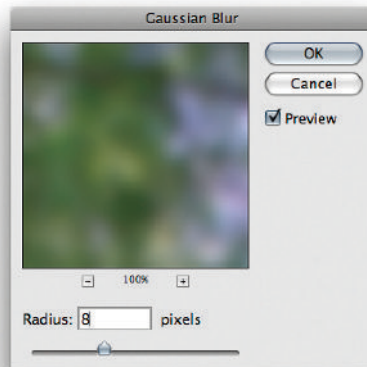
Fog effect

You can use the technique described here to create soft focus effects. Because this method makes use of Smart Filters you can reduce the Smart Filters opacity as necessary to restore more of the original image sharpness and thereby fade the effect. Alternatively, if you paint on the Smart Filters layer mask, you can fill or add paint to the mask and apply the soft focus effect selectively.

1 Here is a woodland forest scene that is in fact an HDR blend, converted to a low dynamic range image. The first step was to go to the Filter menu and choose Convert for Smart Filters. This changed the Background layer into a Layer 0 layer with a Smart Object icon in the bottom right corner.

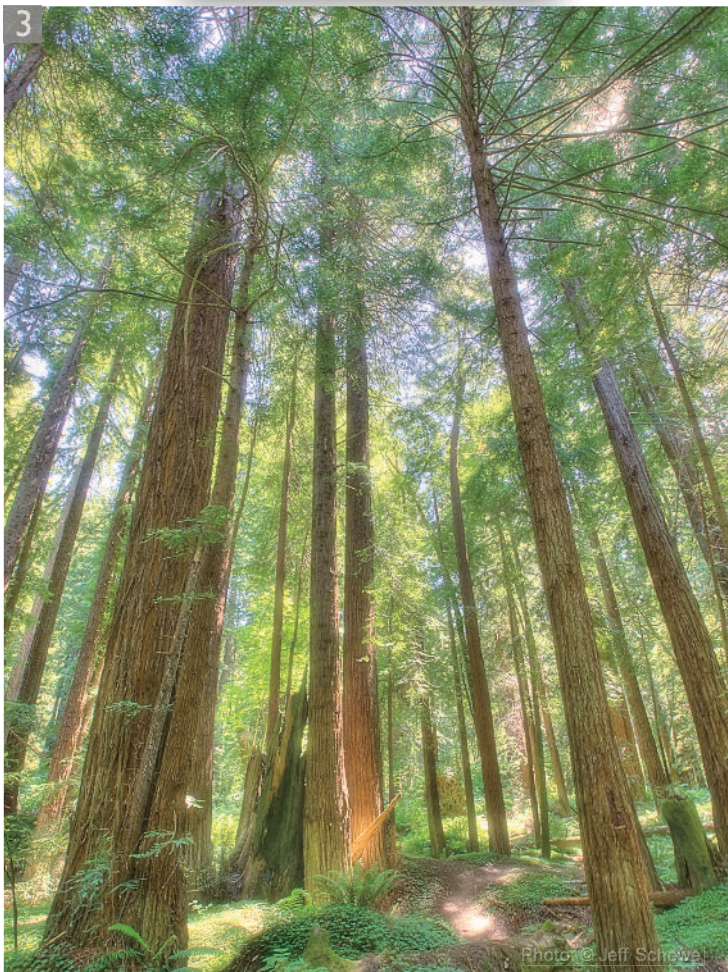


2



2 I then went to the Filter menu again, chose Blur ⇒ Gaussian Blur and selected an 8 pixel Radius. It didn't matter too much which setting I applied here, since a Smart Object layer will allow you the flexibility to re-edit the filter settings any time you want.

3



3 Here you can see the Layers panel with the Gaussian Blur Smart Filter layer applied to the image layer. To produce the soft focus lens effect seen here, I double-clicked on the Gaussian Blur filter blending options (circled), changed the Mode to Screen and reduced the Opacity to 70%. The Screen blend mode is ideal if you want the blow-out soft focus look. Otherwise, I suggest you try using the Lighten mode instead.

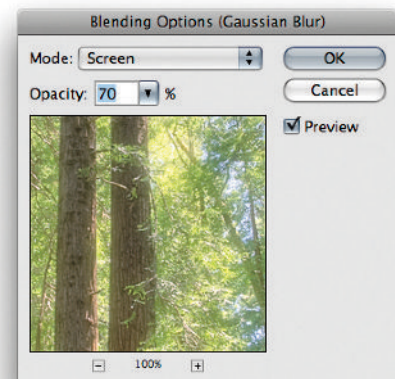
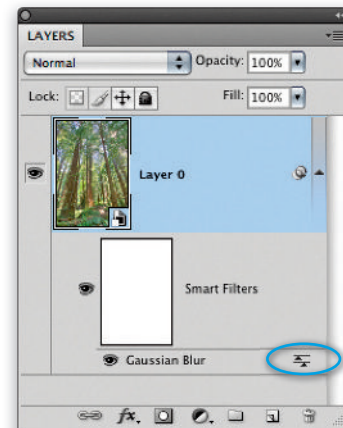
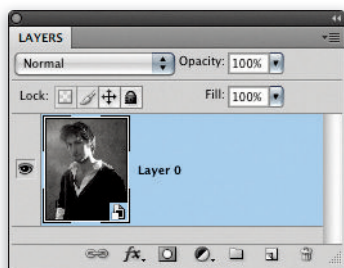


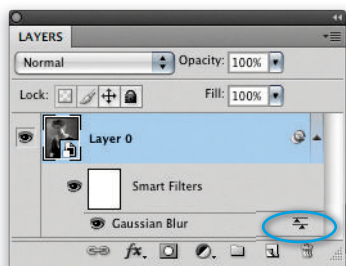


Figure 10.4 Here you can see the lighting setup that was used to capture the photograph shown here.

1 To demonstrate this technique, I started with a black and white studio portrait (see Figure 10.4). I went to the Filter menu and chose Convert for Smart Filters to convert the Background layer to a Smart Object layer.



2 I then went to the Filter menu and chose Blur ⇒ Gaussian Blur. I entered a 20 Radius blur here, but again, the amount doesn't really matter as with this technique you can re-edit the blur setting at any time.

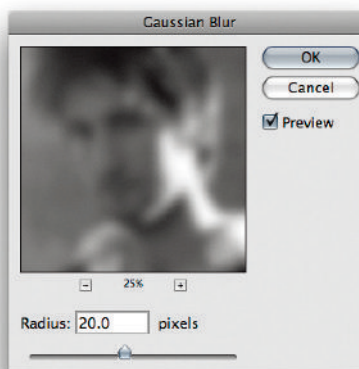


Diffused printing effect

Here is a variation of the previous technique that can be used to simulate a traditional darkroom diffuse printing effect. As I mention at the end, for optimum quality it is best to do this with an image that starts out in 16-bits per channel mode.



2



3

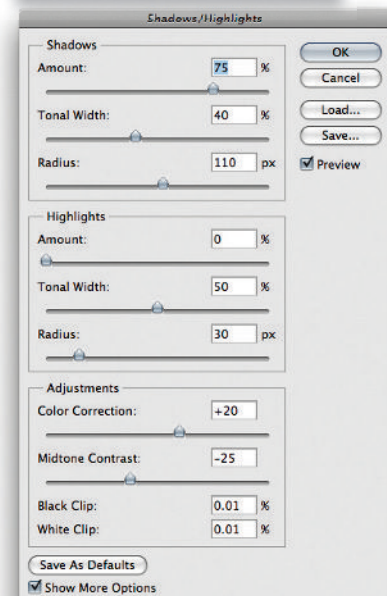
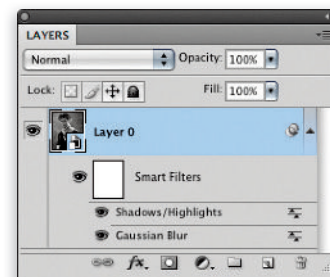


3 I followed this by double-clicking the Blending options icon (circled in Step 2) and set the Mode to Multiply. As you can see, choosing Multiply really darkened the image. You could try lowering the Opacity so that the image doesn't end up quite so dark, or you could try using the Darken blend mode at around 50%, which will also produce a gentler effect.

4



4 In this example, I left the Opacity at 100%, then went to the Image menu and chose Adjustments ⇒ Shadows/Highlights using the settings shown below. Now the Multiply blend mode plus the Shadows/Highlights adjustment are in some ways canceling each other out here, but if the image you are editing has started out in 16-bits per channel, you should still end up with a smooth histogram.

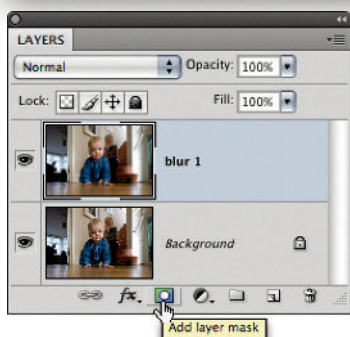
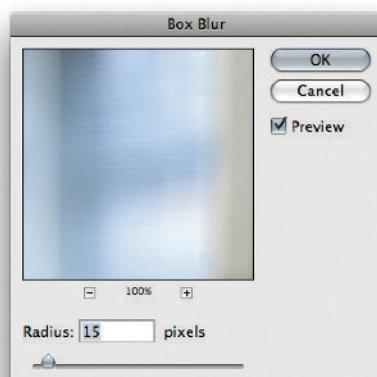


Adding progressive blurs

Sometimes an overall blur isn't what's called for in an image. I like to add multiple blur layers and use a layer mask to paint in or out the blur effect. It's quick and easy to do, as in this example. Here I shot Martin's daughter Angelica with her grandmother Hannah in the background. The shot is nice but the visual complexity of Martin's office is a distraction.

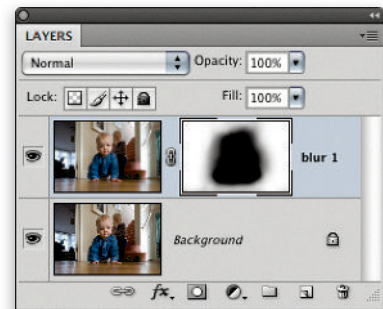


1 This shows the original shot of Angelica with the camera lying on the floor.



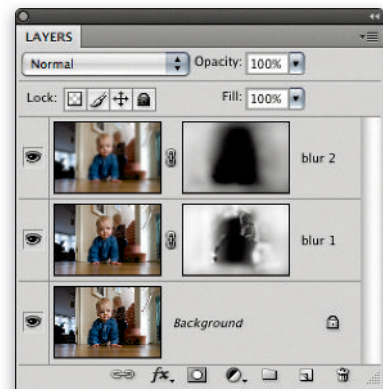
2 I duplicated the background layer and used Filter ⇒ Blur ⇒ Box Blur at a radius of 15 pixels. I then made a Hide all layer mask by holding the  **alt** key and clicked on the Add layer mask button. This way I could paint the blur in, not out.

3



3 Using a very large brush while zoomed out, I painted with white into the layer mask. I did a little touch-up work in the center area by painting with a smaller brush set to black to remove some excess blur effect. I then repeated the entire process of duplicating the background layer and adding another blur layer with a Box Blur of 30 this time. I prefer the Box Blur to regular Gaussian Blur because I like the bokeh (the out of focus look) it produces. It's also a lot quicker than using the Lens Blur (and simpler; I like simple).

4



4 This is the result with the multiple blurs added. Note that the second blur layer's mask cuts down on the opacity of the second blur. The blur 1 layer mask also shows the close work done to keep the blur effect off Angelica and Hannah. The final version here is slightly cropped to hide the bathroom door on the right and a bit more of Martin's messy office (even if it is blurred down).

Image border effects

Adding a border to an image

Here is a simple two-step technique for adding a new border to an image in Photoshop. For the following steps I used a scan of a black and white photograph that had a typical Polaroid™ border.

For those who don't know, the Polaroid company used to make black and white instant print film such as Type 55 or Type 665. The tear-off portion contained a usable negative which, when stripped from the positive print after processing, needed a bath of 18% sodium sulfite to remove the black coating on the back and other gunk. The border picture below shows the characteristic edges that you would get when making a darkroom print from such a Polaroid negative. I mention all this in case you feel like creating your own 'real' border images. Polaroid no longer manufactures the instant print films that they were once famous for, but if you hunt around you may still be able to get hold of old supplies of this material. Otherwise, feel free to use the sample image that is supplied on the DVD, or you could try using any other type of border such as the Clouds filter border effect demonstrated on pages 400–401.



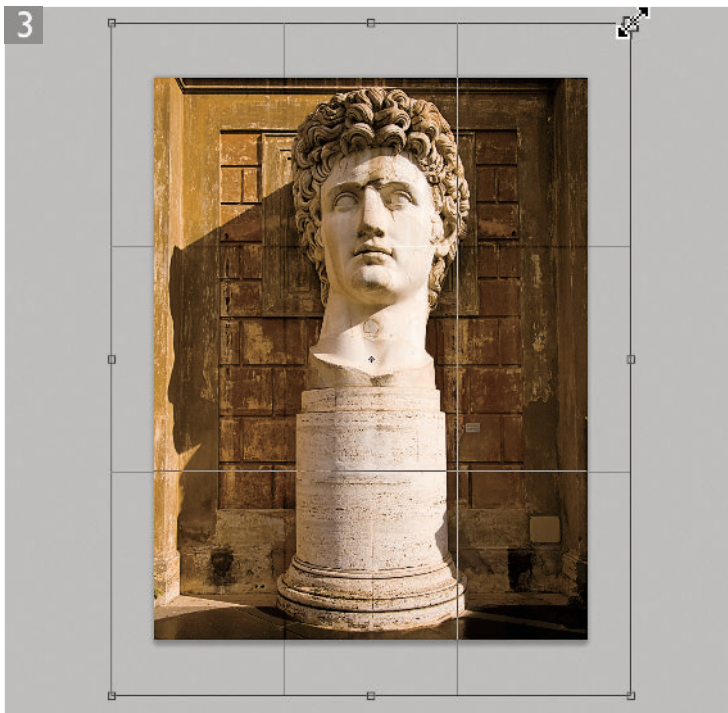
1 I began here with the photo on the left, which was the picture I wanted to apply the border effect to, plus a second photograph which was a scan made from a print of a Polaroid™ processed border.

2



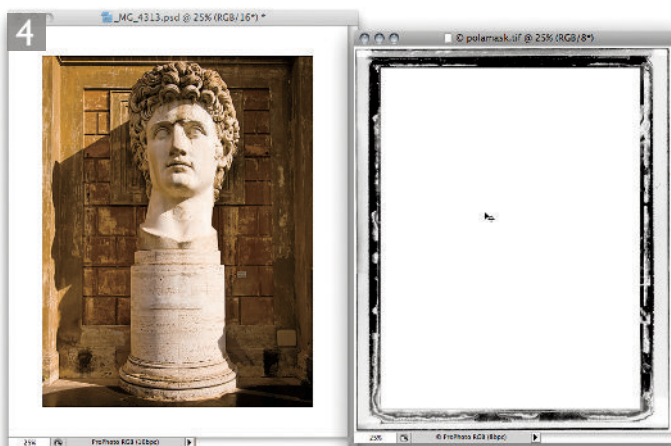
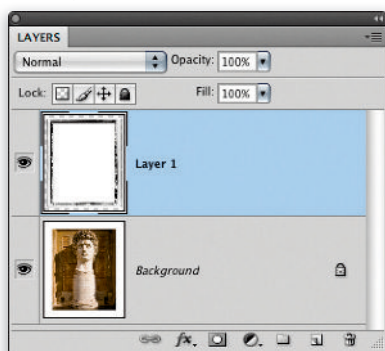
2 To prepare the Polaroid border image, I selected the rectangular marquee tool and carefully dragged inside the border area to define the inside area and, with white as the foreground color, used **Delete** **alt** **Delete** to fill the selection area with white. This cleared the inside area of the border frame and prepared it for use later in Step 4.

3

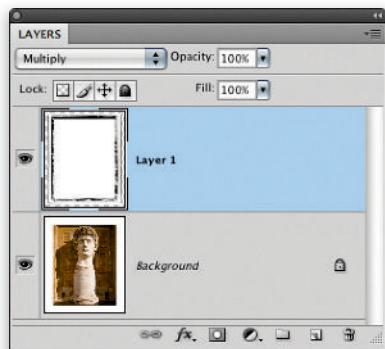


3 I now selected the main photograph and set the foreground/background color to the default setting so that white was the background color. I expanded the window size to show more of the canvas surrounding area. I then selected the crop tool and dragged to first select the whole of the image. I then held down the **alt** key as I dragged on a corner handle to expand the crop size. This is a quick way to expand the canvas area of an image, while keeping the crop centered. I then hit **Enter** to apply the crop.

4 I now had the main photograph (with a white border) plus the expanded Polaroid border scan open in Photoshop. I selected the move tool, clicked on the border image and dragged it across to the other photograph. As I did so, I held down the **Shift** key so that the border image was placed as a new layer, centered in the image.

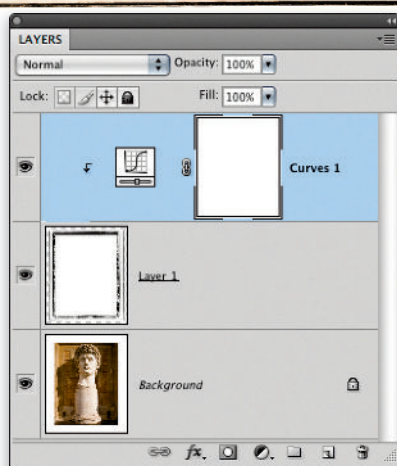
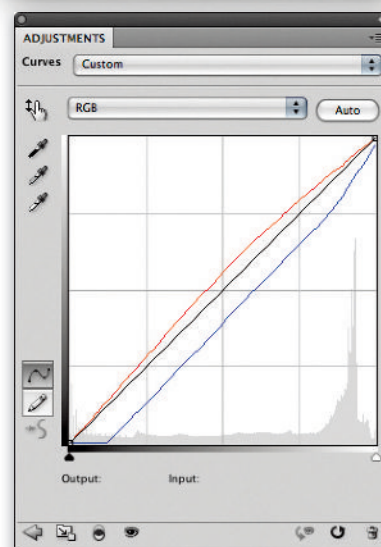
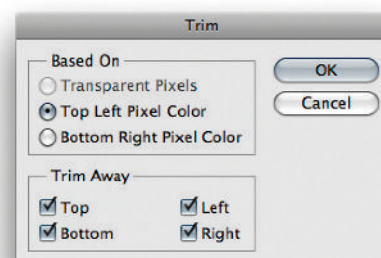


5 I then changed the blending mode of the Polaroid layer to Multiply to merge the border layer with the underlying Background layer. Because the central portion of the layer was filled with white, this part of the layer (and any other white areas) appeared transparent. Once I had done this, I selected **Edit** ⇒ **Free Transform** to scale the border image layer so that it neatly overlaid the image below.





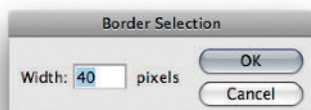
6 To remove the surplus border I went to the Image menu and chose Trim... I used the settings shown below to trim the image size based on the Top Left Pixel color (although Bottom Right would have worked just as well). Lastly, I added a Curves adjustment layer that was clipped to the border image layer. I adjusted the color channels in this Curves adjustment so that it colored the border image layer to create a warm sepia color tone that matched the colors in the underlying photograph.



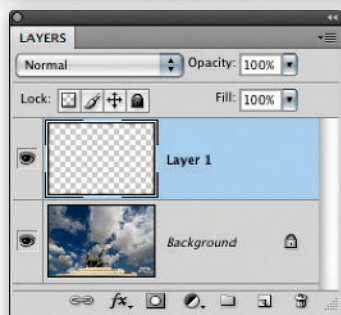
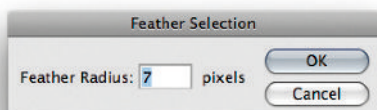
Difference Clouds

The Difference Clouds filter has a cumulative effect on the image. Applying it once creates a cloud pattern based on the inverse color values. Repeating the filter produces clouds based on the original colors, and so on, as the filter effect builds up more cloud contrast.

1 I opened an image, added an empty new layer and chose **Select ⇒ All**, followed by **Select ⇒ Modify ⇒ Border**, and entered a pixel value that was large enough to create a suitable-sized border.



2 I then feathered the selection by a much smaller percentage. In this example I created a 40 pixel border selection and feathered it by 7 pixels. I reset the foreground/background colors, went to the Filter menu and chose **Render ⇒ Clouds**.

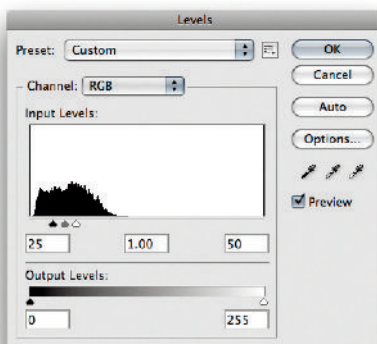


Adding a Clouds filter border

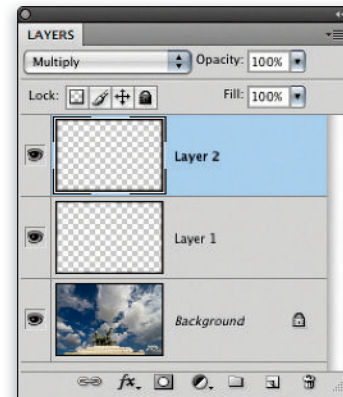
The Clouds filter is available from the **Filter ⇒ Render** submenu and can be used to generate a cloud pattern that fills the whole image (or selected area), based on the foreground and background colors. The cloud pattern alters each time the filter is applied, so repeated filtering (using **⌘ F** / **ctrl F**) will keep producing a fresh cloud pattern. If you hold down the **⌥ alt** key while applying the Cloud filter, the effect will be magnified.

In the example shown here, I made use of the Clouds filter to generate a rough-edged border effect, where the border edge will be different each time you apply this series of steps.





3 I added another empty new layer and, with the selection still active, filled the selection with black and set the layer blend mode to Multiply.

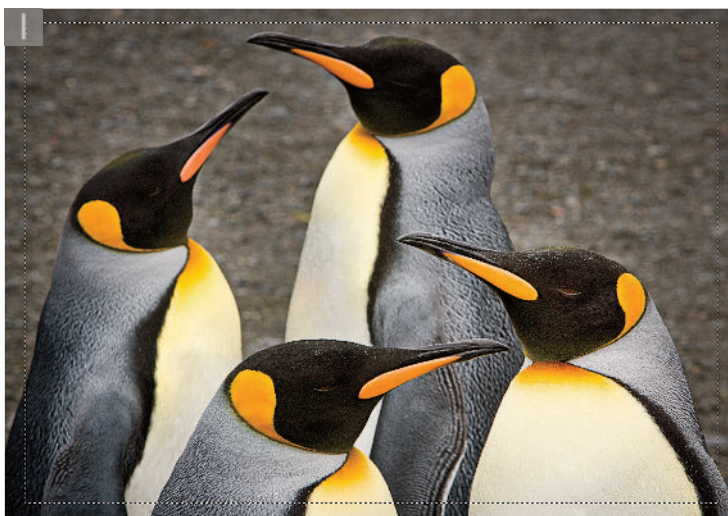
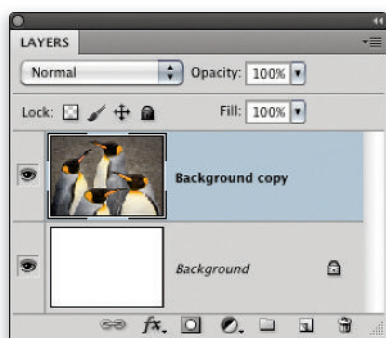


4 I then deselected the selection, merged the two layers, changed the blend mode of the merged layer to Multiply mode and applied an extreme Levels adjustment that hardened the border edges. As you can see, this combination of steps produced the rough edge border effect shown here. As I mentioned at the beginning, the outcome will be different each time you apply these steps. Don't forget that you can also record this as a Photoshop action, although the Border selection width and Feather Radius settings will need to be adapted for different-sized images.

Ragged borders with the Refine Edge command



The Refine Edge command has certainly improved outlining and silhouetting and other selection work. But as often happens in Photoshop's toolset, if you push the envelope of the tools, you can often achieve unexpected but useful and creative effects. One of the Photoshop engineers, Gregg Wilensky, who worked on improving Refine Edge (along with lots of others) discovered that one of the side-effects of using certain settings can be the creation of interesting ragged-edge borders reminiscent of the old chemical darkroom cut-out negative carrier.

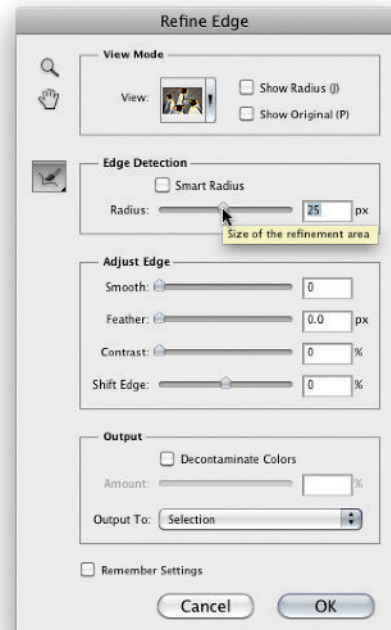
In order to accomplish this you need to make a selection that's less than the entire image and using the Refine Edge command adjust the Edge Detection Radius slider with the Smart Option disabled (wider is often better). After doing that (see Step 2) you'll need to fiddle a bit with the Smooth, Feather, Contrast and Shift Edge settings. For this example I've shown the edges against white, but you can also make black edges (as shown in Step 7).



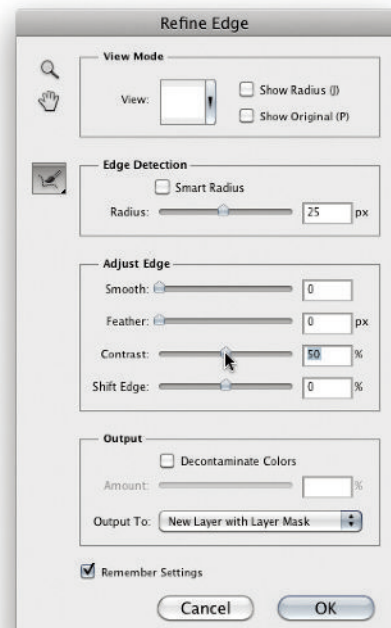
1 I opened an image, duplicated the Background layer to create a copy, then filled the old Background layer with white. To create the selection, I chose **Select ⇒ All**, followed by **Select ⇒ Modify ⇒ Border**, and entered a 150 pixel value to create a suitable-sized border. The actual numbers I've used here were really entirely dependent upon the resolution of the file I was working on. In this example, the image of king penguins was shot on a Canon EOS 1Ds MIII but was downsampled to 3600 x 2505 pixels (12" x 8.35" at 300 PPI). After creating the selection border, I went back to the Select menu and chose **Inverse** to invert the selection, followed by **Modify ⇒ Smooth Selection** to round out the corners a bit, and used a 50 pixel Sample Radius.

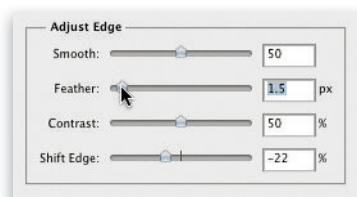
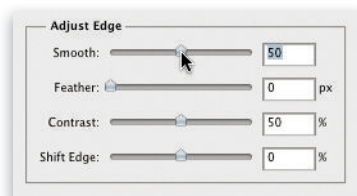


2 With the selection active I went to the Select menu again and selected the Refine Edge command (  **R** *ctrl+alt+R*). For this resolution, I applied an Edge Detection Radius of 25. This meant the command would look 25 pixels on either side of the selection to make image-adaptive adjustments to the edge. Different tones of the image would result in different contours that created the rough edge. This was only the first adjustment — if you are following these steps using one of your own images, the odds are real good you'll want to revisit this setting after fine-tuning the other settings.

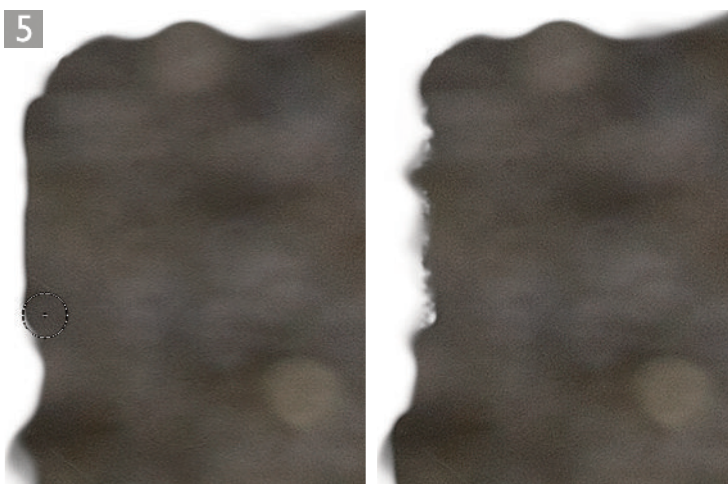
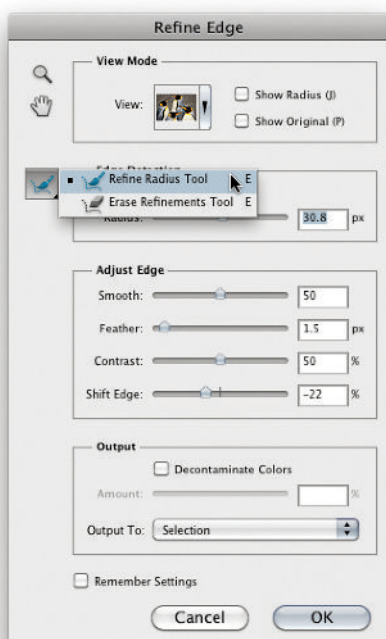


3 The next step was to begin modifying the resulting edges. The detail image above left was the result of Step 2. The detail image on the right was after I had adjusted the Contrast to 50. You'll note that in the right-hand example the middle tones of the edge have now become sharper. I would also adjust the sharpness further in Step 4 on the following page.





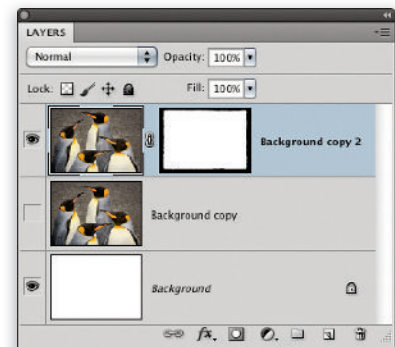
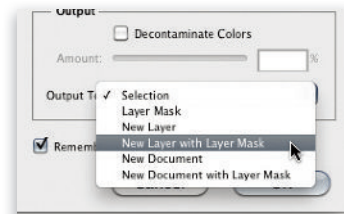
4 I next adjusted the Smooth settings. This reduced the complexity of the resulting edge, as shown above left. You'll note, however, that there was still a granular texture, which I removed by adjusting the Feather setting to 1.5. The resulting image, above right, used a 1.5 pixel Feather (which is essentially the same function of adding a 1.5 pixel blur to the edge). I'll also point out that I added a -22 Shift Edge setting to make the resulting white edge border a bit smaller (closer to the penguins).



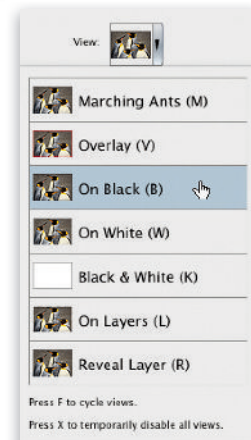
5 After applying the Adjust Edge settings, I modified the Edge Reduction Radius (typical changing of my mind). In the panel you'll see I adjusted the radius to 30.8 pixels. I also wanted to modify the default edge using the Refine Radius tool. The detail image above left shows me painting with the tool, while the detail image above right shows the results of the new edge. I did this carefully, which is why I zoomed into the image. I ended up painting around the entire image edge. The Refine Radius tool seems to work very well at 'disturbing' the edges and making them appear more spontaneous. However, I've never found the results of using the Erase Refinement tool to be useful for this sort of application.



6 Under the Output options, I selected New Layer with Layer Mask. That way I would be able to preserve the original image in case I wanted to make adjustments. I also selected the option to Remember Settings (you can refer to Step 2 to see the entire dialog).

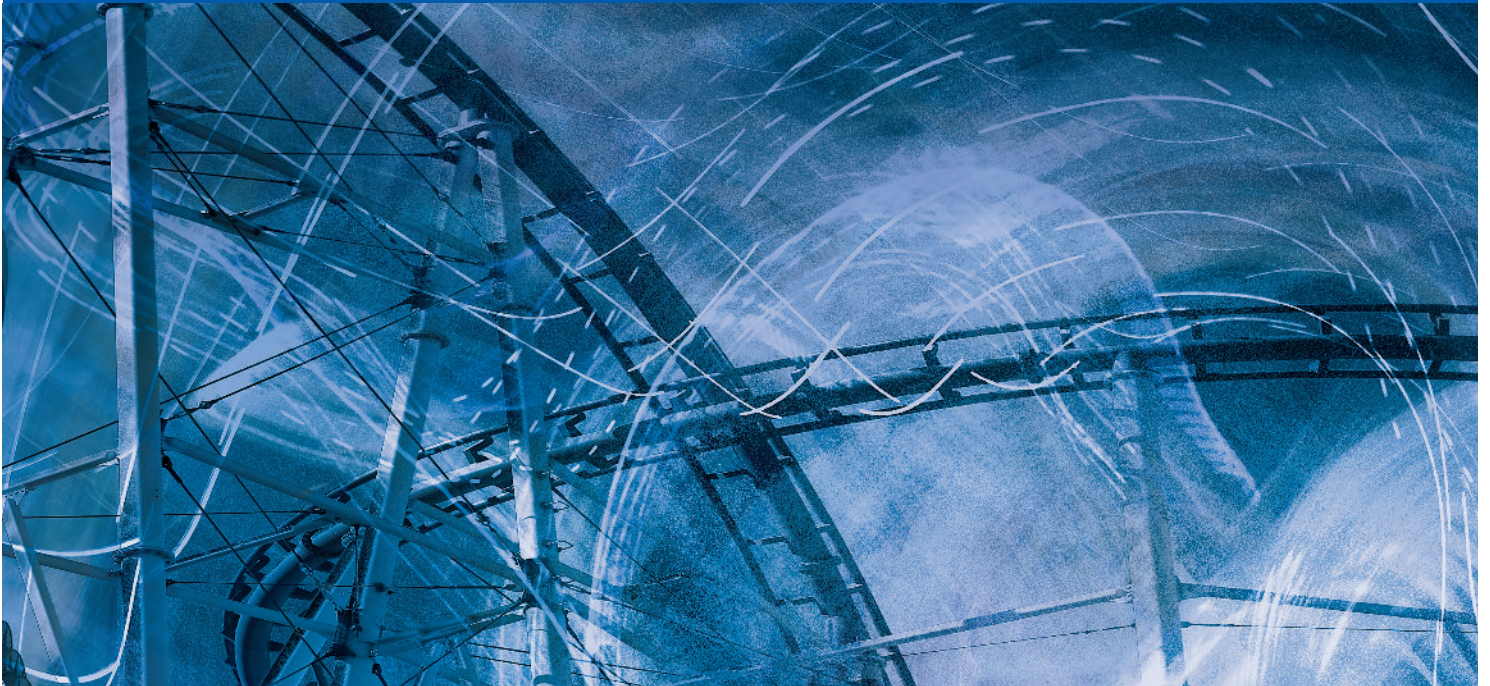


7 While I liked the results in Step 6, my own personal preference was to use a black edge rather than white. So, I filled the bottom layer with black instead of white and also made the rough edge much smaller. Of course, while working on the image using Refine Edge, I could always have previewed the result against black by changing the View options to display On Black.





Photograph: Martin Evening.
Jeff Schewe portrait | Canon EOS 1Ds Mk III | 40 mm | 1600 ISO | f3.2 @ 1/40th



Chapter 11

Robo Photoshop

Using Photoshop automation to develop an efficient workflow

Perhaps in Fritz Lang's movie *Metropolis*, the Maschinenmensch (German for 'machine-man' or robot) would work tirelessly in Photoshop processing images non-stop at their human's behest. Unfortunately (or fortunately), that isn't our reality. Your Photoshop will just sit there waiting until you make it do something. If you have to sit in front of Photoshop and push every single button for every operation, you'll find that you'll have little life outside Photoshop. Photographers, who must deal with thousands of images, really need to automate as many steps as they possibly can. Photoshop offers some pretty useful tools you can use to develop an automated workflow and that's what this chapter is all about.



Figure 11.1 The figure above is an example of a Pixel Genius capture sharpening action containing 72 individual steps.

Turning Photoshop into a robot

Actions in Photoshop

Photoshop added Actions (recordable macros) back in version 4.0, which was released in November 1996. The original engineer, Sean Parent, first designed the ability to record a series of processing steps to be able to play them back later. Prior to version 4, everything you wanted to do in Photoshop literally had to be done mouse-click by mouse-click. Back then, when imaging artists and photographers usually worked on a relatively small number of image scans, that wasn't too terrible. Today, with photographers producing tens of thousands of digital captures, life without actions and batch processing would be unbearable.

Not everything in Photoshop can be recorded as an action. For example, brush strokes of brush-based tools can't. However, you can record the selection of a brush tool and set the parameters. Fortunately, the functions that can be recorded are extensive and can contain an enormous number of steps. Figure 11.1 shows an example of a long and complicated action originally recorded by Bruce Fraser for the PhotoKit Sharpener automate plug-in. We doubt that we'll be giving too much away by showing this figure – you can't actually see the recorded parameters, just the order of the steps. We're showing this only to illustrate just how complex an action can be. This isn't even the most complicated action that Pixel Genius has created; that action contained just under 200 steps written by Martin for PhotoKit Color 2.

What should you record as an action? Our rule is that any step or series of steps performed manually on a repeated and regular basis should be considered a candidate for an action. A simple example might be recording an action to take an active selection and save it as a channel. How many times have you navigated to the Select menu and used the Save Selection command? Sometimes, you may perform one series of steps which could be recorded followed by some manual steps that must be done by hand, followed by yet additional steps that can be recorded. Actions can be recorded to handle those situations. Ultimately, many actions will be most useful when run on many images in a Batch process. I'll cover recording and batch processing in detail, but first I'll introduce you to running actions you already have. Hopefully, I'll show you how to make your actions speak louder than words!

Playing an action

The Actions panel in Photoshop CS5 already comes with a set of actions called Default Actions. While I wouldn't characterize them as killer effects, they do offer an example of the types of action you can record. Included in Photoshop CS5 are additional actions in the Adobe Photoshop CS5 main folder/Presets/Actions. An easy way to load them is to click on the Actions panel fly-out menu and select them directly. Figure 11.2 shows selecting the Commands action set. If you want to have action sets you've created show up in the fly-out menu, you can save them in the Actions subfolder.

To play an action open an image, select the action (not the action set) and click on the Play button as shown in Figure 11.3. An alternative method of playing an action is to **⌘ ctrl** double-click directly on the action. Depending on the steps and options that are recorded in the action you may end up surprised (particularly an action you didn't record). When you open an image to run an action for the first time, we suggest you duplicate the image first (Image ⇨ Duplicate) and close the original image. You can never be too sure what might happen to the image when running an unknown action. While it's unlikely an action would be able to save over your original file by accident, running an action on a copy will mean your original file is completely safe.

When running an action, we strongly suggest you let Photoshop do its work and not interrupt the progress. Martin likes to call this his golden rule and suggests not doing *anything* when an action is running. I'm also cautious but I've actually found that playing an action and then minimizing Photoshop or going to the Finder will actually accelerate the processing of the action because Photoshop will hide all the panels and blank out the document window so Photoshop can apply all its processor clicks to processing, not updating panels and image previews. I do agree with Martin that it's always a bad idea to click on another open image window while an action is already running. Photoshop will quit running the action on the original image and pick up the action steps left and apply them to the second image. We consider this a bug, not a feature.

An action will fail to run if the current state of your image doesn't have the same state that was originally recorded in the action. For example, if your action has a recorded step that modifies a selection such as a feather, you can't run that action

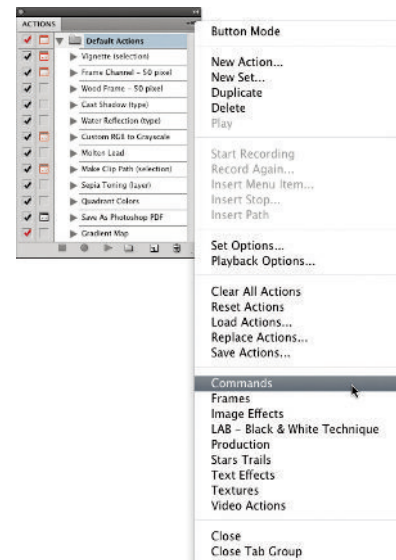


Figure 11.2 Clicking on the Actions panel fly-out menu shows the actions included in the Photoshop CS5 action presets.

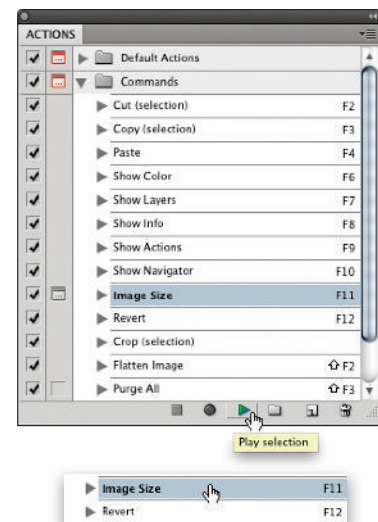


Figure 11.3 To play an action, select the action you wish to run and click on the Play button. Alternatively, you can **⌘ ctrl** double-click on the action to run it.



Figure 11.4 Photoshop's warning indicating that an action step can't run because the command isn't available.

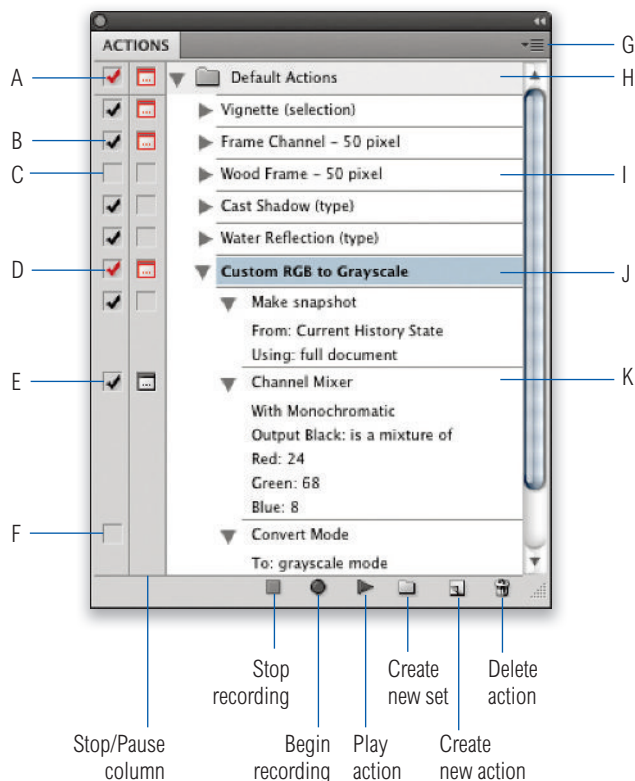
without a selection being active. Photoshop will display a not terribly helpful warning, shown in Figure 11.4. Remember, dialog windows are designed and written by engineers. As such, what may make sense to an engineer might not make sense to a user. This warning basically means you'll need to figure out what condition is needed in order for the action to be played. We'll cover action troubleshooting in depth on page 414 and show you how to deal with errors and make your recorded action bulletproof.

The Actions panel magic decoder ring

You might think that learning how to use the Actions panel would be fairly easy. Yes, and no. Some of the functions and features are pretty straightforward. Other aspects are not very intuitive. We thought it would be useful though to label everything for you in Figure 11.5.

Figure 11.5 The Actions panel showing various panel indicators and buttons.

- A: Action set contains inactive actions.
- B: Action contains a pause to reveal a dialog.
- C: Action disabled (turned off).
- D: Indicates one or more actions steps are inactive and contains a pause.
- E: An active action step with a pause to open a dialog box.
- F: An action step that is disabled.
- G: The Actions panel fly-out menu.
- H: An action set expanded.
- I: An action with the steps collapsed.
- J: The targets action with steps expanded.
- K: An action step expanded to show recorded parameters.



The Actions panel fly-out menu

The fly-out menu contains some useful commands not found on the Actions panel. At the top is the command to switch to Button Mode. Because we have so many actions, Button Mode, which makes the Actions panel into a bunch of action buttons, is completely impractical. The next group contains commands that are duplicated on the panel except for the action Duplicate command, which can be useful if you keep a bunch of individual action steps and want to copy them into new actions. The next section also contains a couple of panel-based commands but also has three important commands: Insert Menu Item, Insert Stop and Insert Path. The Insert Menu item allows you to record an action that calls up a command from within the Photoshop menu structure. We use this command a lot. The Insert Stop command allows you to record a series of steps and puts in a stop that shows an informational message and allows the action to continue after the dialog dismissal.

The next two commands, Action Options and Playback Options, are very important. Figure 11.7 shows the two dialogs. The Action Options dialog allows you to rename the action, assign a function key and have the action show in a color in the event you do want to use the Actions panel in Button Mode. The Playback Options allow you to control how an action is played. Usually, you'll want to use the full-speed Accelerated option. However, the Step by Step comes in real handy when trying to troubleshoot an action error. The Pause For option allows you to slow playback down real slow. Slow enough that each step can be displayed on your image so you can watch each step as it is applied to the image.

The fifth section contains commands to load or save action sets as well as reset or replace the sets already loaded. The last two sections contain the action presets and the Close panel or Close Tab Group options.

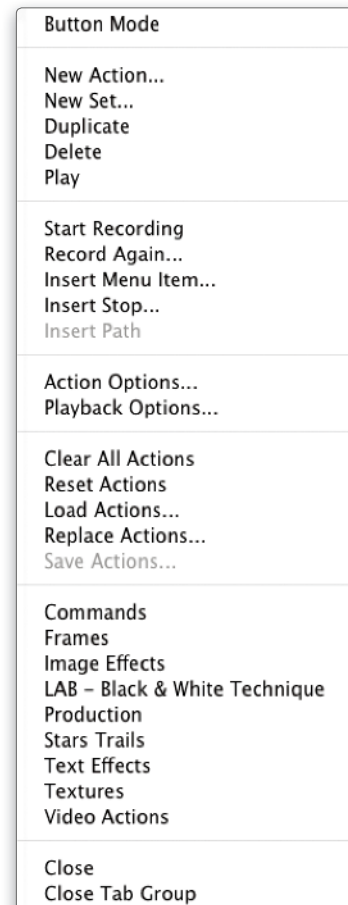


Figure 11.6 The Actions panel fly-out menu.

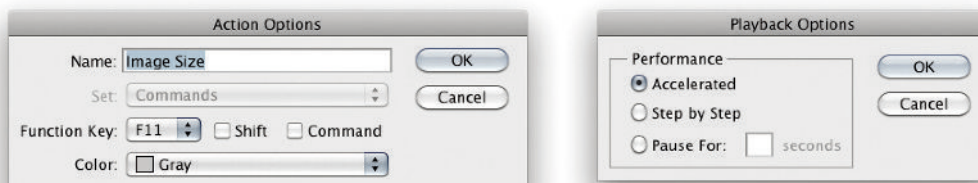
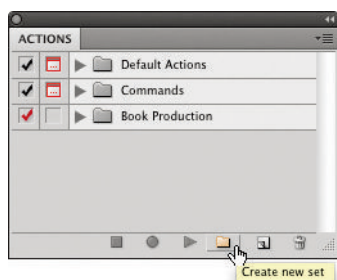


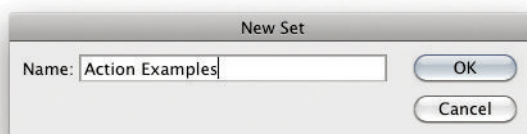
Figure 11.7 The Action Options and Playback Options dialogs.

Recording a very basic action

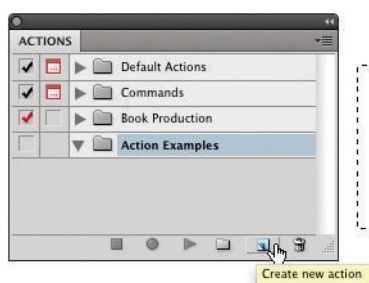
Before you can run you must first learn how to walk. So, in this first section, I'm going to show the recording of a very basic action: feathering an active selection. If you are already experienced with recording your own actions, you might wish to skip ahead a bit.



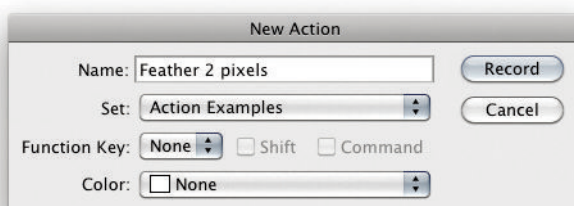
1



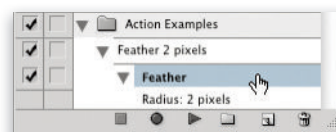
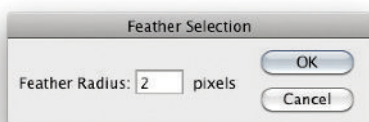
1 To record an action I first needed to add it to an existing set or create a new set. Clicking on the Create new set icon (shown left) launched the New Set dialog shown above. Here, I named the set and clicked OK.



2



2 Once the new set was created, I clicked on the Create new action button. Note that in this instance there needed to be a selection active which would be the state upon which the feathering would depend. I wouldn't be able to record a feathering step if there wasn't already a selection. Also, I would need to have a selection active for the recorded action to play. Otherwise I would see a warning dialog like the one shown in Figure 11.4.



3 Once I started the action recording, any steps I did in Photoshop would get recorded (except for brush strokes). I navigated to the Feather command from the Select ⇒ Modify submenu. I entered a 2 pixel radius then clicked on the Stop recording button. Note that the action step displays the recorded parameter. In the figure above right, I double-clicked directly on the action step to be able to edit the action step as shown in Figure 11.8.

Basic action editing

Once you've recorded an action, you can edit the parameters originally recorded and rename the action. You can also duplicate the action and modify how the action will play. Figure 11.8 shows how to edit an existing action. Figure 11.9 shows how to duplicate an action and Figure 11.10 shows how to toggle the dialogs and action steps on and off.



Figure 11.8 To edit the recorded parameters in an action step, double-click the action step (not the action itself) as shown above left and enter the revised parameters. In this example I renamed the action to reflect the new parameters (shown above right).



Figure 11.9 While you can select an action and use the Duplicate command from the Actions panel fly-out menu, I prefer to simply drag the action to the Create new action button. This does exactly the same thing and results in a copy of the original action. In addition to duplicating actions, you can duplicate action steps in this manner.

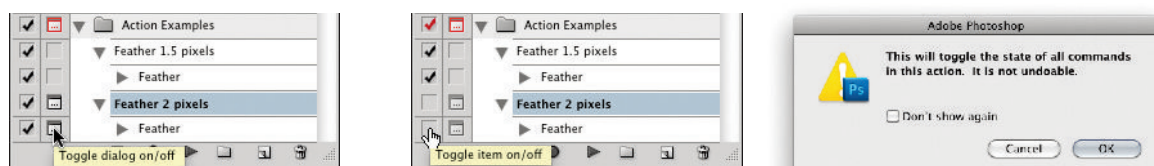


Figure 11.10 If an action step involves some sort of dialog window, you can choose to toggle the dialog on or off (above left). Generally, if you want the specific recorded parameters to be used, I suggest you leave the dialog off. I usually record an action using an Insert menu item in the event I want to manually enter parameters. If you wish to disable an action step (I often decided after I've played an action that one or more steps are less good) you can toggle that step off, as shown above right. If you toggle off an entire action, you'll get the scary-looking warning shown on the far right. Yes, you can't 'undo' the act of toggling, but you can always 'redo' toggling the action back on.





Volatile actions

Once you have recorded an action, the action is only stored temporarily in the Actions panel unless you save it out as part of an action set. As a result, if Photoshop were to crash after recording a lengthy and complicated action it would be gone, gone, gone. We have both been bitten by this, so the first thing we do after recording a complicated action is to save the set immediately.

Recording ruler units












For actions that involve recording the placement of objects or drawing of marquee selections, it is a good idea to record setting the ruler units as part of the action. For example, if you go to the Photoshop preferences and choose Units & Rulers, you can set the rulers to Percentage. By recording this as part of an action, any subsequent placement of Photoshop guides, placement of the type tool or use of the marquee tools can be recorded relative to the proportions of the document. When you then replay an action, the action should work effectively no matter what the size or proportions of the image.







Descriptions of all actions

If you hold down the     keys as you choose Save Actions... this saves the text descriptions of the action steps for every Photoshop action that's currently in the Actions panel.

Troubleshooting actions

If an action doesn't work, first check that the image you are playing it on is in the correct color mode. Many actions are written to operate in RGB color mode only, so if the starting image is in Lab, CMYK or Grayscale mode, any color adjustment commands that were recorded using an RGB file won't work properly. You will also run into issues running actions recorded on 8-bit depth files using filters that aren't available for 16-bit depth.

Recorded actions may make assumptions based on the image containing only a flat, simple *Background* layer. Martin prevents this from being a problem when he records actions by starting each action by using the    shortcut (to select the top-most layer), followed by the Merge Visible to new layer shortcut (       ). These two steps will always add a new, flattened merged copy layer at the top of the layer stack. The lack of an actual *Background* layer (as happens when doing a photomerge) can also stop many actions from playing. There's not much you can do about this, other than to create a new layer on the bottom of the layer stack and convert that new layer to a *Background* layer by choosing Layer ⇒ New ⇒ Background from Layer before playing the action.

If you have an action that is producing unexpected results, you can inspect it command by command by selecting the Step by Step option in the Actions panel fly-out menu. Martin's method is to open a test image, expand the action to display all the items, select the first step in the action, hold down the   key and click on the Play button. This allows you to play the action one step at a time. You need to have the   key held down and keep clicking the Play button to continue playing the remaining steps. If there is a problem with one of the action steps then double-click that action step in the list to rerecord it. You will then need to make sure that action step is selected, keep the   key held down again and click on the Play button to continue.

Limitations when recording actions

Most Photoshop operations can be recorded as an action, such as image adjustments, History panel steps, filters, and most Photoshop tool operations. You should be aware that tools such as the marquee are recorded based on the current set ruler unit coordinates (see sidebar on Recording ruler units). Recording

actions that include steps that create new layers, channels or paths must be recorded with unique naming so as to avoid the pitfall of ambiguous names. For example, if you have an action that creates a new channel named *Alpha 1* (which is the default name for the first new channel) that action will fail if you try to run that action with another image that already has a channel named *Alpha 1*. When moving layers in a recording, use the main Layer menu or Layer key command shortcuts to reorder the layer positioning. Doing this will make your action more error proof.

When recording an action, only the changed parameters are recorded, not the parameters that may already exist. To solve this potential ‘gotcha’ you need to intentionally misadjust the parameters before recording the action. Then start recording and enter the desired correct settings. There are other dependencies that can be recorded that may cause errors when playing an action. The recording of an Open or Save step as part of an action hard codes the exact directory path of drive and folder as part of the action. If that drive or folder becomes unavailable, the action will fail. This often happens when you record a Save step to a removable hard drive. If that drive is removed, you’ll see an indication of the missing folder in the action step as shown in Figure 11.11. If you remount the missing hard drive the action should find the folder on the original drive. Alternatively, you can create a new folder on a different drive and double-click on the save step and in the Save dialog, navigate to the new folder.

Some people use the technique of recording an action to play another series of recorded action steps – recording an action playing another action. This can be a convenient shortcut when building a complicated series of actions. However, you should be warned that if one of those sub-actions is missing (accidentally deleted or renamed) the main upper level action will fail. Figure 11.12 shows a complicated action named Process Raw Workflow. That upper level action calls upon a series of separately recorded sub-actions. Each of those sub-actions must be available in the action set named Workflow Actions. You’ll note that the blue-circled step Ink Jet 360 Sharpen is no longer contained in the Workflow Actions set. Playing the Process Raw Workflow action will fail and display the error message shown in Figure 11.12. This dependency is something we avoid by usually recording each and every step of an action independent of other actions.

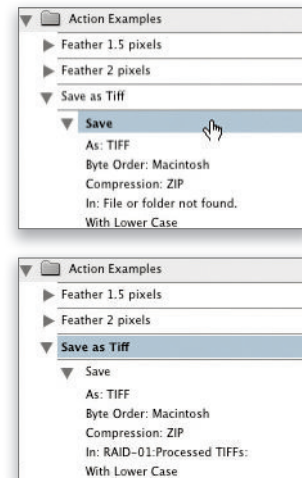


Figure 11.11 The action step with a directory path that is not found (top). To fix the path, double-click on the step and find the missing path or create a new directory path (bottom).

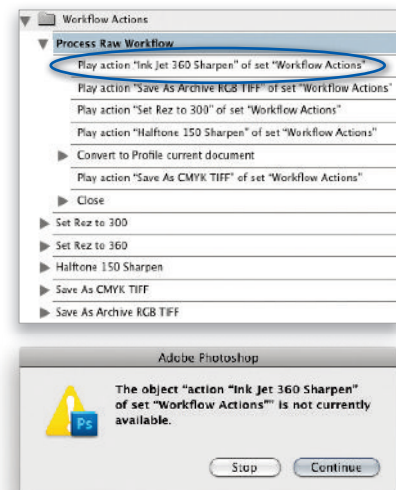


Figure 11.12 The upper level action depends on a series of sub-actions. The first sub-action, named ‘Inkjet 360 Sharpen’, has been deleted. Trying to run the upper level action will produce the error message above.

Batch processing

The ultimate in Photoshop robotics is the ability to set up and run the Batch process in either Photoshop or Bridge. Once you master the recording of actions, it's a natural progression to use those actions to fully automate image processing on whole bunches of images without you having to be behind the steering wheel. Figure 11.13 shows the Batch dialog as well as the important dropdown menus you'll need to configure.

The Source dropdown menu tells Batch where to get the files to process. The main dialog shows Bridge as the source. The expanded drop-down menu shows the menu options when accessed via Photoshop's File ⇨ Automate. The Bridge option is grayed out because Photoshop can't communicate with Bridge, just Bridge to Photoshop. The Destination drop-down menu lets you select where the processed files are saved. If you have already recorded a save as part of your action, you can choose None. If you want the

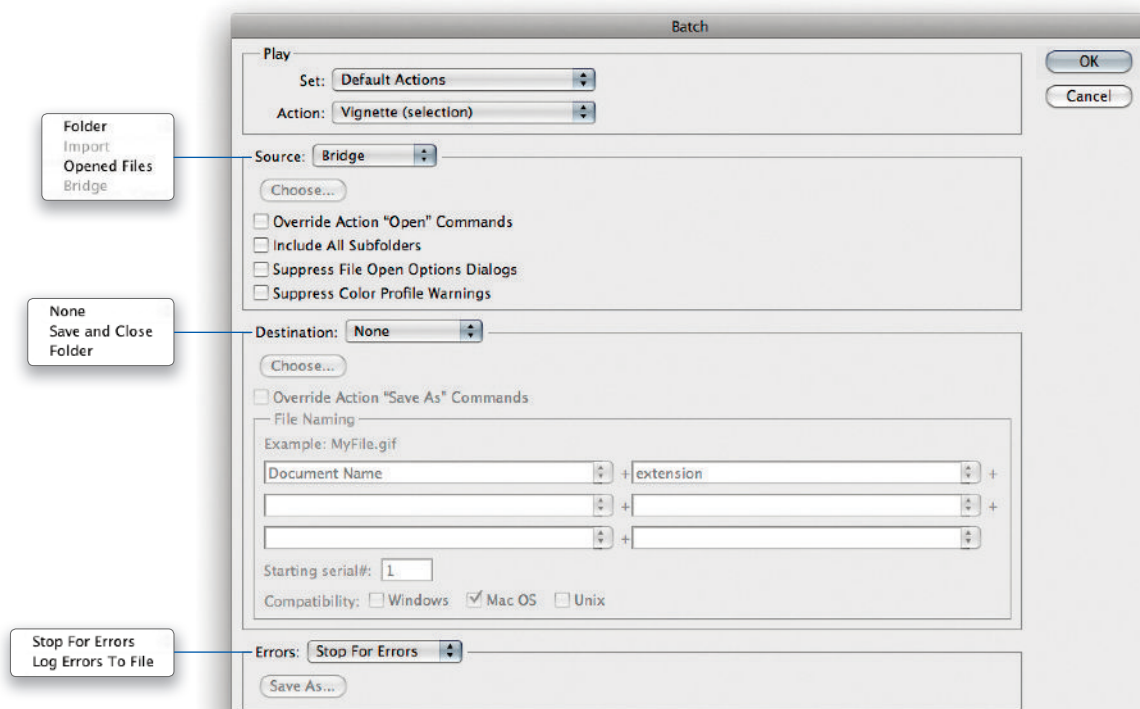


Figure 11.13 The Batch dialog shown above was accessed by choosing the Tools ⇨ Photoshop menu in Bridge.

processed files to save over the originals, Save and Close is useful (but scary). I usually use the Folder option and navigate to the folder I want to have the processed images saved to. Batch does provide the ability to rename files but Bridge CS5's Batch Rename tool has outstripped the functionality provided here. I generally don't rename in a Batch process. The last drop-down menu allows you to control what happens when there are errors. I always have this option set to Log Errors To File. There's nothing so irritating as coming back to the computer after a few hours only to find Batch has halted part of the way through because of an error.

The Batch dialog check boxes offer some obvious and not so obvious options. Figure 11.14 shows all of the options selected. I often have them all checked. The one that you may not use often is the Suppress File Open Options Dialogs. Opening PSD, TIFF and JPEG files won't pop an Open Options dialog, but if you rasterize an EPS file you will get an Options dialog which can be suppressed.

The two confusing options are Override Action "Open" Commands in the Source section and Override Action "Save As" Commands in the Destination section. Can you say 'engineer-speak'? The bottom line is there are two basic rules: one for how to deal with opening files and the other dealing with how to save files. If you have recorded an actual Open step as part of a batch action, the rule states you must check this option otherwise nothing will happen in the Batch. Same deal if you recorded a Save As step. Figure 11.15 shows you the warnings that will appear when selecting either of these options. Confused? Let me try to translate them for you. If you've recorded an Open step in an action you'll generally want to override the file and directory path of the Open step and only use the recorded Open parameters. A typical example would be recording an Open step using Camera Raw and making sure your Workflow Options were set to the correct color space and bit depth. I'll show you a concrete example in the Raw Processing batch workflow section starting on page 419. Similarly, when you record a Save As step and want the Batch Destination to be a different folder than what you recorded in the action, you would record the Save As step for but then check Override Action "Save As" Commands to override the destination recorded in the Save As step. The Save As step would then only play the file format options of the action. Practice makes perfect but know that even we sometimes make mistakes.

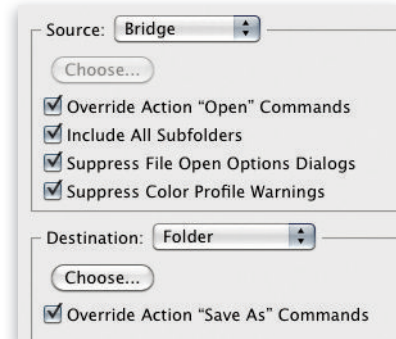
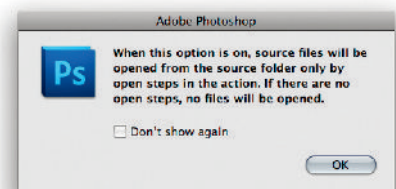
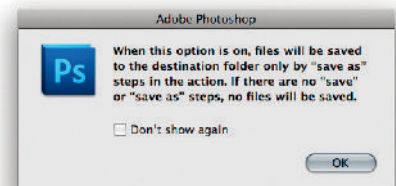


Figure 11.14 The Batch dialog Source and Destination check box options.

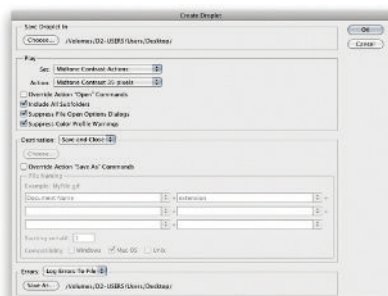


The warning about Open steps

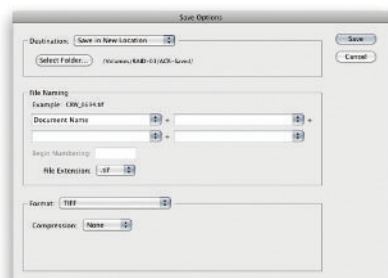


The warning about Save As steps

Figure 11.15 These are the two difficult to translate warnings when you check either the option to 'Override Action "Open" Commands' on the top or the 'Override Action "Save As" Commands' on the bottom.



Create Droplet tool



Camera Raw's Save Image tool

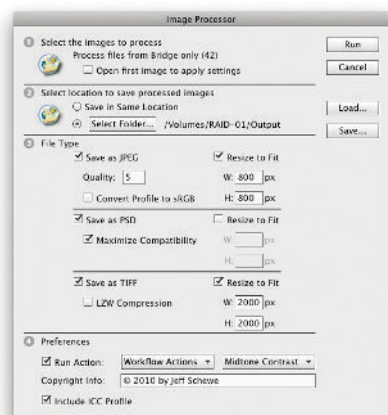


Image Processor

Figure 11.16 Team Photoshop's automation role players.

Alternative automated processing tools

On any championship sports team, you'll find a few highly paid 'all stars', but the great teams also need to fill out their roster with role players. So it is with Team Photoshop. Actions and the Batch command are the 'all stars'. The role players include Droplets, Camera Raw's Save Image command and the JavaScript named Image Processor. They all fill out Photoshop's automated processing tool set and each provides arguably simplified but useful automation functionality. I don't mean to underplay their importance, I use all three tools on occasion. But since they are simpler to use than Actions and Batch we're only highlighting their existence here. Figure 11.16 shows the three tools.

The Create Droplet tool allows you to take an action and make an executable application (the droplet) that is essentially a saved Batch process. You process files or folders of files by dragging and dropping them on the Droplet to run the process. They can also be cross-platform. If you get a Droplet saved from a Mac, you can convert it to Windows by dragging the Droplet to the Photoshop application icon. The one limiting aspect of Droplets is that they hard code the original action into the Droplet and thus a Droplet is no longer editable.

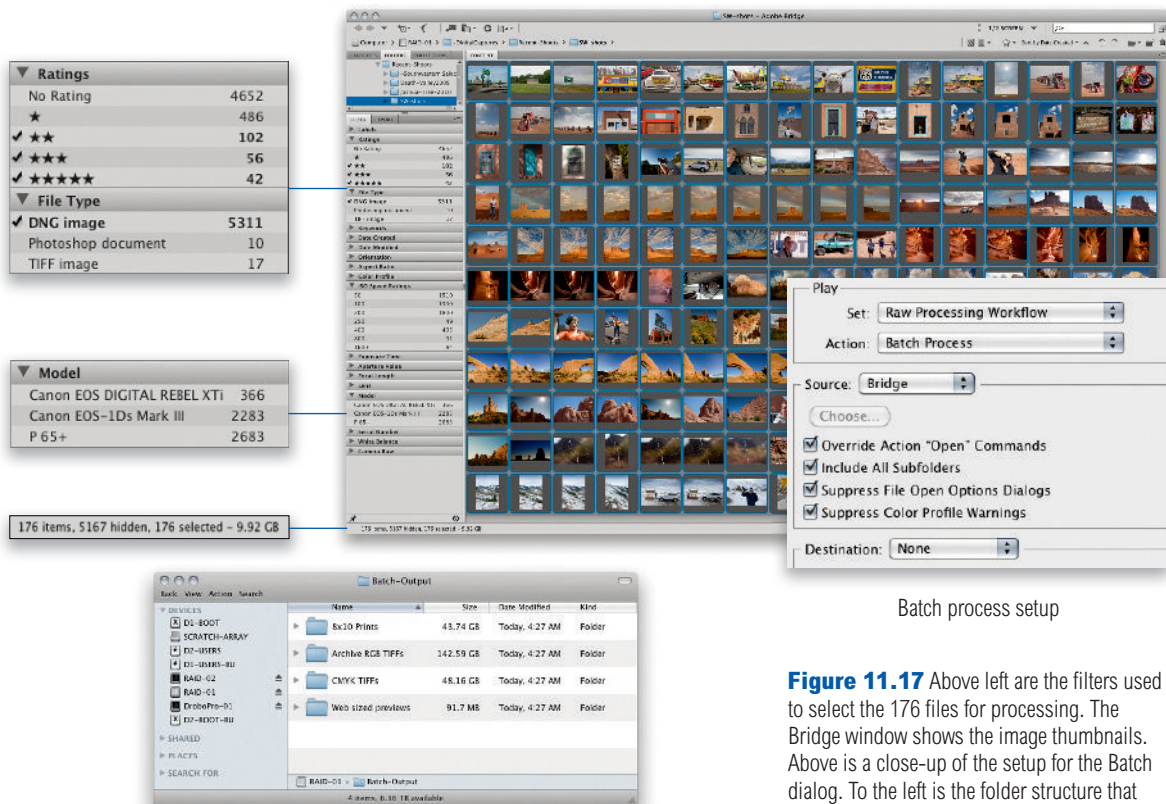
Camera Raw's Save Image tool is an excellent time-saving feature for saving files directly out of Camera Raw. It's limited to a single file format and destination at a time so it isn't as powerful as a Batch process. But it is simple and can speed up raw processing.

Image Processor, which is actually a JavaScript, was originally 'Dr. Brown's Image Processor'. It is a stripped down batch processing tool available in Bridge via Tools ⇨ Photoshop. It's also available in Photoshop via the File ⇨ Scripts submenu. Image Processor can be set up to save out JPEG, PSD and TIFF versions of the processed image. The processed files are saved in the destination in separate folders named for the file format. Image Processor has the capability to resize images and you can even have Image Processor include running a Photoshop Action. Photoshop has other JavaScripts you can run for more limited, specific automation functionality. I wish I could learn how to write a JavaScript, but alas, it's beyond my skill set. But take heart, there's a whole community of scripters and third-party creators that offer free or fee-based scripts and actions hosted by Adobe at www.adobe.com/exchange. The Adobe Photoshop Marketplace has its aisles jam-packed with actions, scripts, brushes, shapes, styles and filters.

An automated raw processing workflow

Combining Bridge, Camera Raw and Photoshop

The ultimate payout for learning how to use actions and batch processing is the chance you might get of having a life outside of Photoshop. The chore of selecting images in Bridge, opening them in Camera Raw and processing them through a Batch process can be made far more efficient through automation. In this example of creating an automated raw processing workflow I'll be using images shot while on a photo road trip to the American South West with Martin, where I shot over 5300 raw captures. Figure 11.17 shows only the DNG files selected with two stars or better for a total of 176 files selected for processing. It also shows the Batch process I set up as well as the four folders of about 235 GB of processed files that this produced.



Batch process setup

Processed files saved in folders

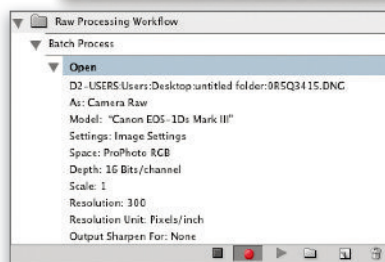
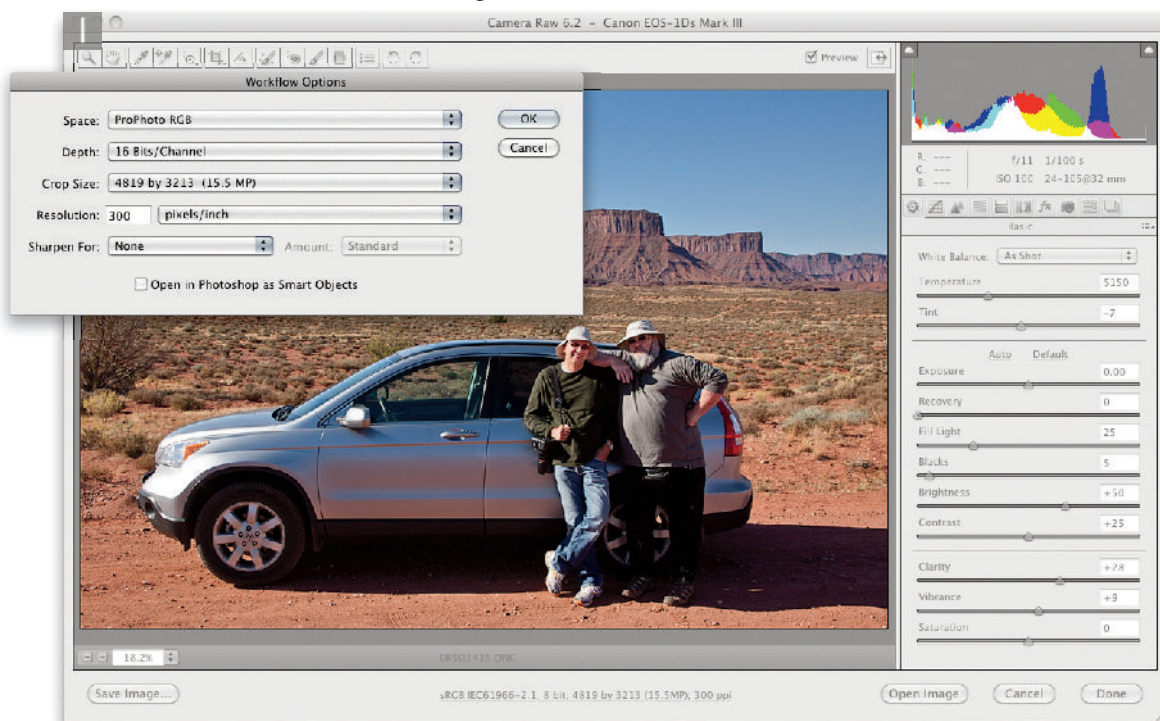
Figure 11.17 Above left are the filters used to select the 176 files for processing. The Bridge window shows the image thumbnails. Above is a close-up of the setup for the Batch dialog. To the left is the folder structure that the processed files were saved to on the hard drive. Processing took 1 hour, 4 minutes.



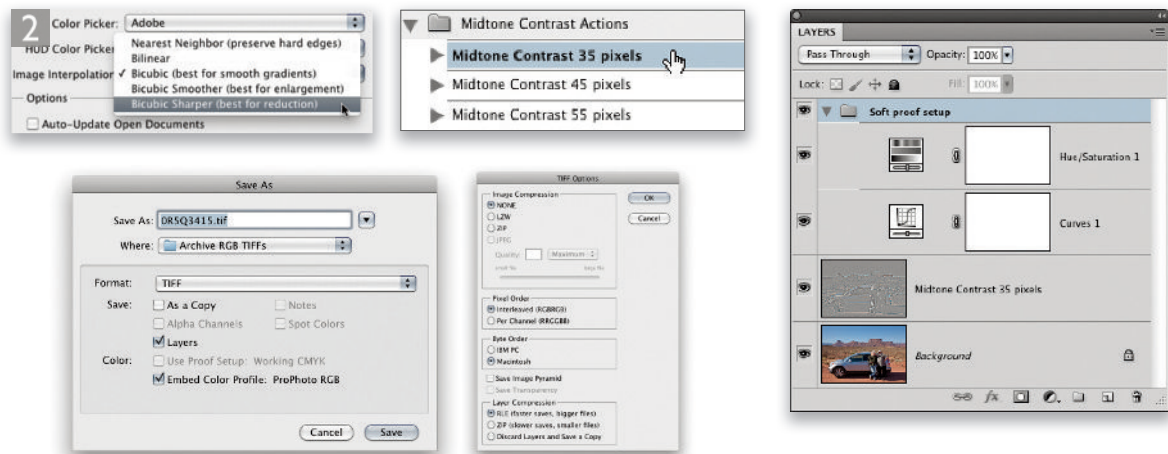
Figure 11.18 To start off recording an Open action, I like to use a sample raw image on my desktop and drag and drop it onto the Photoshop icon to open the image into Camera Raw hosted by Photoshop.

Recording the batch action

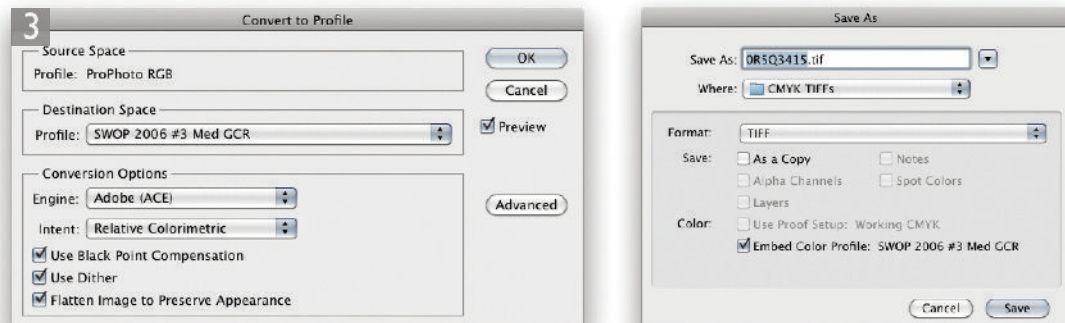
In order to show recording the batch action, I'll need to condense some of the steps. Don't worry though, I'll make the action available on the DVD so you can examine everything. I'll also include the Midtone Contrast Actions that include the one sub-action used in the processing. However, the Open and Save As steps will need to be rerecorded to use on your computers. The first and perhaps most important step after creating the set and starting to record the action is to open an image into Camera Raw to capture the Workflow Options settings. Figure 11.18 shows my favorite way of opening an image into Camera Raw.



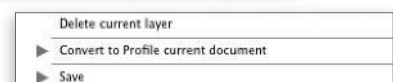
1 I opened an image via the drag and drop method and clicked on the Workflow Options info button to record setting the Workflow Options. Before I had even started recording the action, I had opened the image and set the Workflow Options to 8-bit sRGB. That way, when recording, I could be absolutely sure that the change to 16-bit ProPhoto RGB at 300 PPI would be recorded. I made sure I didn't make any image adjustments that would also get recorded – this is critical because you don't want the action to override the existing adjustments! To the left is the open step as recorded. I hope Martin doesn't mind me using this self-portrait, which was shot just outside of Moab, Utah. Yes, the camera was on a tripod and I used the self-timer.

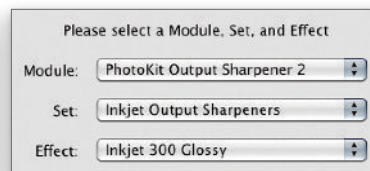
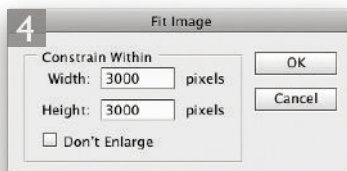
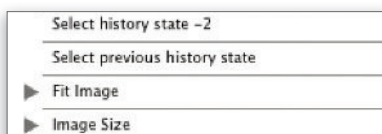
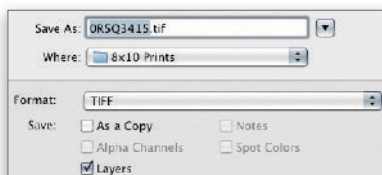
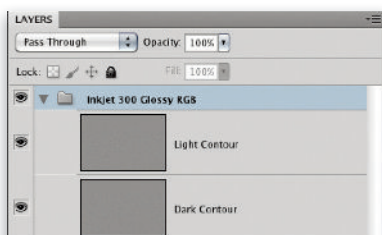
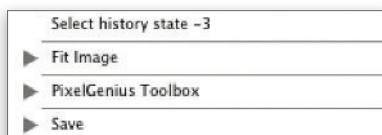


2 The next series of steps, which I've combined into one, included changing Photoshop's preferences from Bicubic to Bicubic Sharper (above left), playing the Midtone Contrast 35 pixels action (above right), and adding a Curves and a Hue/Saturation adjustment. I then put both adjustment layers into a layer group named Soft proof setup (above far right). Once that was done, I chose Save As from Photoshop's File menu and navigated to the folder named Archive RGB TIFFs. This saved the full-resolution file with all layers in the correct folder inside the Batch-Output enclosing folder. The action so far would only save out one iteration of each of the 176 files. You can see how this would be useful, but wait, there's more; a lot more! The next step involves recording the conversion of the image from RGB to CMYK and saving that version in a different folder.

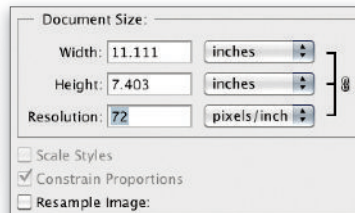
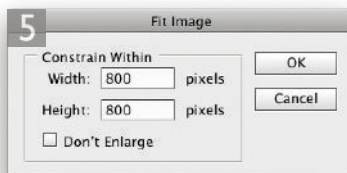


3 In order to do a conversion from RGB to CMYK, I used the Convert to Profile command under the Photoshop Edit menu. I used the Convert to Profile command instead of simply doing a mode change to CMYK because not only could I record the exact profile to convert to, but also I could have the file flattened (and I could preview the CMYK conversion while recording). After doing the conversion, I did another Save As command and navigated to the CMYK TIFFs folder. Astute readers may wonder what became of the Soft proof setup layer group. I had actually deleted it before I converted to CMYK because the Soft proof setup was designed for inkjet printing so I didn't want it applied to the CMYK image.

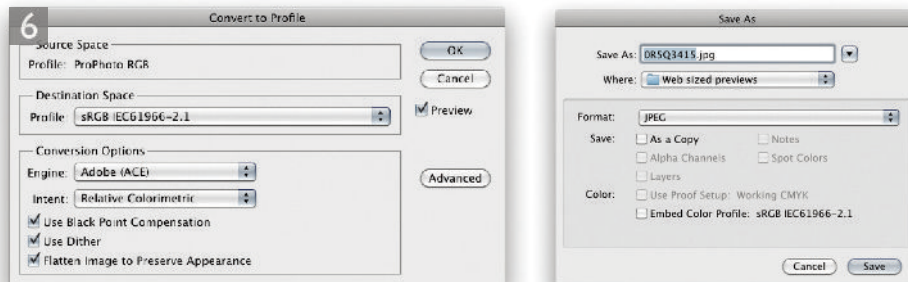




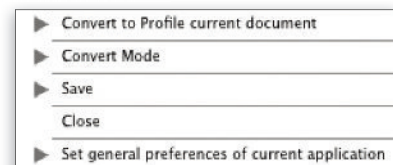
4 The next series of steps actually started by going back in History before the CMYK conversion to the point just before I deleted the Soft proof setup layer group. I had deleted the group for the purpose of doing the conversion to CMYK but wanted the layer group for these recorded steps. This series was intended to downsize the full size and resolution images for 8 x 10" prints at 300 PPI. Since I had already set Camera Raw to open the images at 300 PPI, I only needed to downsize them. Rather than trying to use the Image Size command, I chose to use Fit Image from the File ⇨ Automate menu. I chose to Constrain Within 3000 x 3000 pixels, which would make horizontal and vertical images 10" on their longest side. I wish Actions and/or Batch would allow conditional based functions, but alas, it's not there yet. Fit Image is as close as you can get for image sizing. Since I wanted to be able to make prints, I also wanted to do output sharpening. I used PhotoKit Sharpener set to Inkjet 300 Glossy. I also recorded yet another Save As step. I chose TIFF again and saved it to the 8 x 10 Prints folder, making sure to save the layers for later editing. The next series of steps is intended to make web-sized preview images.



5 It was at this stage of the recording that I made my first mistake (I warned you I wasn't perfect). I again used History to go back two steps. Unfortunately, my guess was wrong and I had to go back an additional History state. You can see the steps in the action. This brings up a good point about recording actions – ideally, you would organize all the steps you wanted to record. I have at times hand-written notes about what step to record in what order. Other times I just wing it as I did in this example. If you make a mistake you can do one of two things: stop the recording, undo what you did and delete the step and start recording again, or just correct the error on the fly. If the step involves considerable processing time, I would suggest stopping, making the correction and then starting recording again. In this case, simply stepping back an additional History state would produce no speed penalty so I kept going. After I got back to the correct History state, I used another Fit Image command to downsize the image to 800 x 800 pixels. I also added an Image Size to change the resolution of the image to 72 PPI. You'll note I unchecked the Resample Image option (above right).



6 I once again recorded another Convert to Profile command, this time converting to sRGB for the web. Again I checked the option to Flatten Image to Preserve Appearance. Prior to saving the image, I used the Image ⇒ Mode ⇒ 8-Bits/Channel command to drop down from 16-Bits. I then recorded another Save As command, this time unchecking the option to embed a color profile, and saved the image as a JPEG in the Web sized previews folder. While the image processing steps were now completed, there were two additional steps I recorded, one that is really important: 'Close'. If you don't record an actual Close command, guess what Photoshop will do for you? Yep, it'll keep opening images, processing them and leaving them open. Can you imagine the problems Photoshop would have with 176 images open all at once? After recording that all-important Close command, I also wanted to record another preference change, this time reselecting the Bicubic interpolation option in the Image Interpolation menu.



It's a wrap!

We realize recording actions and doing batch processing isn't very 'visual'. It's pretty technical and rather tedious. However, the payoff is the ability to improve your productivity, increase your consistency and generally make your life a bit easier working with tons and tons of images. You'll note I mentioned consistency; the good thing about having a recorded series of image processing routines is that Photoshop and your computer don't suffer from Monday morning blues (or a hangover). An action played on Monday morning will produce the exact same results on Friday night at midnight.

Figure 11.19 shows the final recorded Batch Process action. Remember, both that action as well as the Midtone Contrast Actions are on the book's DVD. To load them on your own computer, copy them to your hard drive and double-click the .atn file (that's the action format extension). Happy Actionneering!

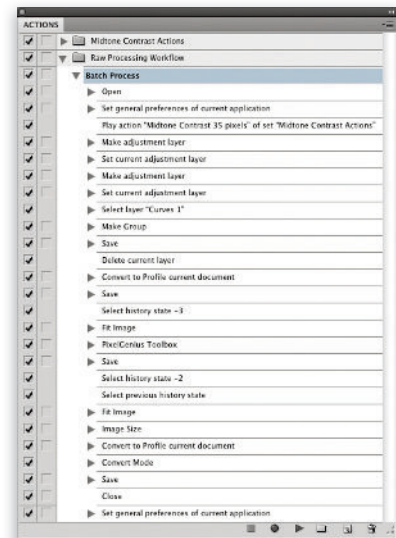
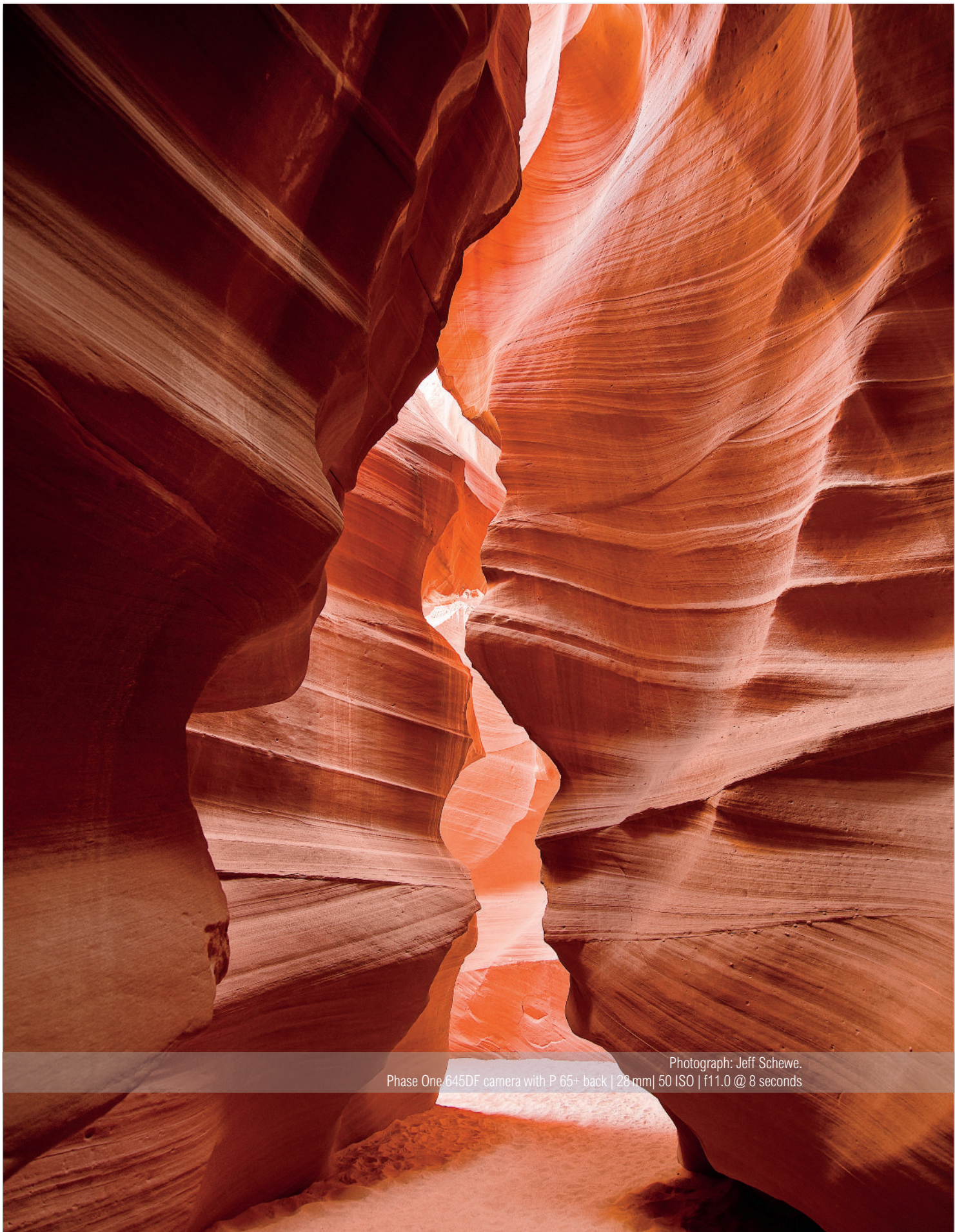


Figure 11.19 The final recorded Batch Process action of the Raw Processing Workflow set.



Photograph: Jeff Schewe.
Phase One 645DF camera with P 65+ back | 28 mm | 50 ISO | f11.0 @ 8 seconds



Chapter 12

Photoshop output

Tips and advice on inkjet and CMYK print output

It is all very well getting your photographs to look good on screen as you retouch them in Photoshop, but as far as most photographers are concerned, it's how the final print looks that matters most. Getting from screen to print should and can be easy, providing you are using a well-maintained, color-managed workflow. Most of the basic tips and advice on printing are contained in Martin's main *Adobe Photoshop CS5 for Photographers* book. What this chapter does is to provide additional tips and advice on setting up an inkjet printer, combined with instructions on how to make custom profiles, how to soft proof in Photoshop plus how to create CMYK proof prints.

Printing in Photoshop

Inkjet printers

Inkjet printers now dominate the printing market and are especially popular with photographers who are using Photoshop. Inkjet printers come in all shapes and sizes from small desktop devices to huge banner poster printers that are the width of a studio.

The first inkjet devices were manufactured by IRIS and designed for commercial CMYK proof printing on a limited range of paper stocks. It was largely due to the experimentation of country rock musician and photographer Graham Nash that the IRIS evolved to become an inkjet printing device suitable for producing fine-art prints. This costly venture began in the early nineties and thanks to these pioneering efforts, was soon to revolutionize the world of fine-art printing. The IRIS printer stopped production in 2000 and its successor was the IXIA from Improved Technologies. The IRIS/IXIA is still favored by many artists, but in the last decade companies like Epson, Hewlett-Packard (HP), Canon and Roland have developed high quality wide-format inkjet printers that are suitable for large-format printing, including fine artwork applications.

The revolution in inkjet technology began at the high end with expensive wide-format printers, but the technology soon diffused down to the desktop. Epson was one of the first companies to produce affordable high quality desktop printers and Epson has retained its lead in printer and consumables technology, always coming out with new and better printers, inks and papers, although companies like Canon and Hewlett-Packard are now beginning to regain their slices of the printer market with printers to rival Epson's continuing dominance.

How inkjet printers work

Inkjet printers work by spraying very fine droplets of ink as the head travels back and forth across the receiving media/paper. The different tonal densities are generally created by varying the number of evenly sized individual droplets. Epson was one of the first to use variable-sized droplets to avoid the appearance of widely spaced and noticeable fixed-size dots in the highlights; now most of the other manufacturers have followed suit, so that the higher dot density in highlights gives much smoother tones.

Inkjets typically do not have a regular arrangement of their color dots, so more closely follow the results of stochastic printing in the litho world. The latest Epson Stylus Pro models use eight or now 10 color inks and these are capable of producing an even smoother continuous tone output. Figure 12.1 shows Jeff by his Epson 7900 printer. The Epson 4800 printer in my office uses additional light black, light light black, light cyan and light magenta inks to render the paler color tones. The print output is therefore very smooth because there is no discernible dot dithering in the lighter areas. But more significantly, the K3 inks are capable of reproducing richer colors than can be seen on even the wider gamut LCD computer displays, such as the Eizo or NEC models.

Inkjet printers are used for all sorts of printing purposes. An entry-level inkjet can cost as little as \$100 and would be suitable for anything from office letter printing to outputting photographs from Photoshop. And you don't have to spend much more than a few hundred dollars to buy an A4 or A3 printer that is capable of producing photo-realistic prints.

Although inkjets use CMYK inks or CMYK plus the additional inks (such as those mentioned above), they work best when they are fed RGB data. This is because a lot of these printers use Quartz rendering (Mac) or GD (PC) drivers as opposed to PostScript. These print drivers can't understand CMYK. So if you send CMYK data to the driver it will convert the data from some form of generic CMYK to RGB before converting the data again to its own proprietary CMYK color. Later on in this chapter we will discuss how it is possible to use an inkjet printer to produce acceptable guide prints for CMYK press color matching. For example, if you perform the color management in Photoshop and disable the printer color management, it is also possible to produce what is known as a cross-rendered CMYK guide print from an RGB file, using the Proof Setup dialog to specify a CMYK space to proof with.

The ideal inkjet

Your first consideration will probably be the print size and how big you need your prints to be. Most desktop inkjet printers are able to print up to A3+ (13" × 19"), while the Epson 3880 can print up to 17" × 35" in size. The wide-format printers like the Epson

Output through a RIP

Some standard print drivers may use a mix of inks to print dark colors. But a good photo RIP like ColorBurst™ will use proper black generation (GCR) control to minimize color shifts in prints.



Figure 12.1 Here is Jeff standing by his Epson 7900 printer (which has recently been replaced with the larger 9900 size). Photo © by Henry Wilhelm.

Hewlett-Packard Z series

The Z series printers include two 12-ink color models. These printers have an incredibly wide color gamut which is achieved by the addition of red, green and blue inks.

Epson x900 class printers

Epson makes the 7900 and 9900 series printers which use 10 color inks. Jeff is particularly impressed with the gamut and D-max of the new UltraChrome HDR inks to the extent that your choice of color workspace in Photoshop is more important than ever if you are to make the most of this latest breed of printer. Only ProPhoto RGB can take advantage of the full range of colors these two printers can achieve.

9900 can print up to 44" wide and the Hewlett-Packard printers as wide as 96" (the Hewlett-Packard Z series also has built-in X-Rite calibrators that can help maintain closed-loop color accuracy). Wide-format printers are suitable for all commercial purposes and are particularly popular with fine-art photographers who need to produce extra-large exhibition quality art prints. These bigger printers are designed to be freestanding and therefore require a lot of office space.

Photographic print quality

Almost any inkjet printer can give you acceptable print quality, but some printers are definitely more suited for photographic quality printing than others. The Epson Stylus Pro range of printers is marketed as a good choice for photographic print output because they use specially formulated inks and print with six or more ink colors, which can yield superb results. Printers like these and others can also be adapted to take third-party inks that are specially formulated for black and white or fine-art printing. The Epson 3800 printers are suitable for fine-art printing with longevity and have an extra light black ink which also makes this an almost ideal printer for black and white work (as is the more robust Epson 4880, which also provides you with the ability to use bigger ink cartridges). In recent years, Hewlett-Packard has ramped up its range of photo printers. For example, the PhotoSmart 9180 is simple to set up and also features a built-in calibration device.

Image preservation

The longevity of an inkjet print will be determined by a variety of factors. Mostly it is down to the combination of the inks and media that are used to produce the print, followed by the environment in which a print is kept or displayed and whether it has been specially treated to prevent fading. Light remains the biggest enemy though. If prints are intended for long-term exhibition, then you have to make sure that you use a suitable ink and paper combination, and that the prints are displayed behind UV filtered glass and sited so they are not exposed to direct sunlight every day.

The premium glossy and semi-gloss papers are a popular choice for photographers as these papers match or exceed the quality of a normal photographic print surface, and the print longevity when used with the Epson 4880 is estimated to be close

to 100 years. A lot of photographers and artists have enjoyed experimenting with various fine-art paper stocks. When these are combined with the right types of ink, it is possible to produce prints that can be expected to last even longer.

If you are printing to black and white and use the Advanced Black and White Epson print driver (which is available on the higher end models such as the 2880), this will print the photos using just the black, light black and light light black inks with minor amounts of cyan, magenta or yellow. When you print using the Advanced Black and White mode you are using pure carbon pigments and the estimated lifetime for these types of prints is up to 300 years.

Inks and media

To start with I recommend that you explore using the proprietary inks and papers that are ‘officially’ designated for use with your printer. Firstly, it should be pointed out that the manufacturing engineers have designed these ink and paper products expressly for their printers and, secondly, the printer companies will usually supply canned profiles which these days are often very accurate. Therefore, if you stick to using proprietary inks and papers at the beginning there are fewer variables for you to worry about when you are learning how to print from Photoshop.

There are two types of inks used in inkjet printers. Dye inks were once the most popular because they were capable of producing the purest colors. But the dye molecules in such inks were also known to lack stability. This meant they were prone to deteriorate and fade when exposed to prolonged intense light exposure, high humidity or reactive chemicals. Pigment-based inks have a more complex molecular structure and as a result of this are less prone to fading. But pigmented inks have traditionally been considered less vivid than dye inks and have a restricted color palette (the color gamut is smaller).

Some modern inks use a hybrid combination of dyes and pigments. These specially formulated pigment-based ink and paper combinations will produce bright prints that also have exceptional image permanence. When using the correct paper and inks, the life expectancy is predicted to be over 100 years and may be as long as 200 years with certain paper combinations.

Wilhelm Imaging Research

Henry Wilhelm has conducted much research into the various factors that affect the permanence of inkjet prints. The Wilhelm Imaging Research website contains print permanence reports for several printers. Henry has also coauthored a book: *The Permanence and Care of Color Photographs: Traditional and Digital Color Prints, Color Negatives, Slides, and Motion Pictures*, which offers a definitive account on the subject. For more information go to: www.wilhelmresearch.com

Third-party inks

When ordering ink supplies you need to make sure that the cartridges are compatible with the printer and, if using a custom profile, are of the same type. While it is possible to use third-party inks in some printers, we tend to take the view that the ink technology is often just as important as the printer hardware itself and it may prove a false economy to switch to using non-branded inks.

Inkjet economies

Ink cartridges don't come cheap and once you get into serious print making, you will soon get through a lot of expensive cartridges. We don't recommend you economize by buying ink refill kits as these are very messy to use. In the long run it can work out more economical if you buy a printer that uses single ink cartridges with higher ink capacities (don't forget there are places where you can recycle your used cartridges). Basically, the inkjet manufacturers like to sell their printers cheaply and then make their profit through the sales of proprietary inks designed for their printers. If you care to read the small print, using anything but the manufacturer's own inks may void the manufacturer's guarantee.

Canned printer profiles

These days it is much easier to rely on the canned profiles that ship with most of the current inkjet printers (or at least this is true of the Epson printers that we are most familiar with). There are two key reasons for this. Firstly, now that the printer hardware is more consistent in quality, it is possible to build a profile using one printer and have it work well for every other printer. Secondly, the profiles that are supplied are of better quality anyway. You'll also find that third-party media suppliers such as Hahnemuehle (www.hahnemuehle.com) and Innova (www.innovaart.com) are able to supply ICC profiles for their paper products with various printers and these can be downloaded from their websites. Custom printer profiles should be saved using the following locations: Library/ColorSync/Profiles folder (Mac OS X), Windows XP/System/Color folder (PC). For Windows Vista and Windows 7, just right-click on the profile and choose Install.

Building custom printer profiles

Should you feel the need to create your own custom profiles for non-regular ink and paper combinations then you might want to consider having custom printer profiles made. If you don't have the necessary profiling hardware and software, the most obvious thing to do is to contract the work out to a specialist. For example, Neil Barstow is a UK-based color management consultant who offers a CD containing a manual and test files to help you optimize your printer settings. For more information on this and his UK-based color consultation services, go to: www.colourmanagement.net Our good friend and colleague Andrew Rodney is also a color management expert based in the USA and is the author of *Color Management for Photographers* from Focal Press. Andrew offers consultation services and also makes custom printer profiles. For more info see www.digitaldog.net

DIY custom printer profiles

If you wish to build your own custom profiles, then you'll need to purchase something like an X-Rite Eye-One or ColorMunki device plus the necessary software to read the measured spectral data from which a profile can be built. Whichever approach you choose, you'll need to know how to correctly print a test target image.

Printing a printer test target

The idea of printing the color target is to produce a printed chart of colors in which the color information in the target file (Figure 12.2) is sent directly to the printer without any color management being applied to it. The patch readings that are made subsequently using a spectrophotometer device are then used to build a custom color profile for that particular printer and paper combination that will later be able to convert the image data to produce correct-looking colors. However, printing targets have changed in Photoshop CS5 because the No Color Management (NCM) option in the Photoshop Print dialog has been removed (see Figure 12.3 on the following page). However, if you have Eye-One Match or the ColorMunki, you can simply print the targets directly from the color management software.

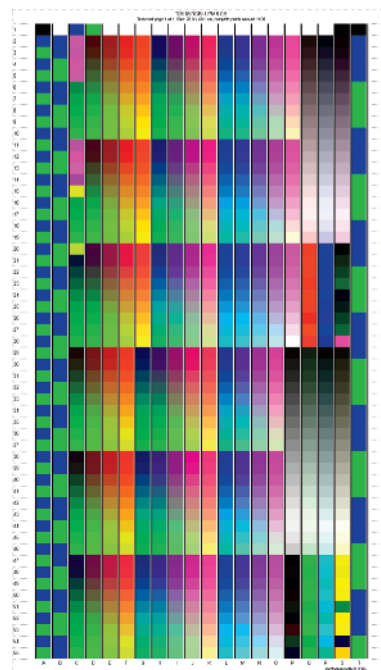


Figure 12.2 Here is an example of an X-Rite color target which is used to construct an ICC color profile. The print outputs are then measured using a reflective spectrophotometer and a profile built from these measurements. A third-party profiling service will be able to supply you with the test chart and printing instructions. You mail the color management service provider a print and they will email a printer profile back to you.

Adobe Color Printer Utility

When the Photoshop engineers decided to remove the No Color Adjustment option from the Photoshop CS5 Print dialog, there was quite a ruckus from the color management geeks. So, the decision was made to offer a free printing application that could be easily set up to offer cross-platform printing of color targets. At the time of this writing, we're not 100% sure of the name, but it'll be something like the 'Adobe Color Printer Utility' and offered as a free download for Mac and Windows on the Adobe Labs site (www.labs.adobe.com).

Why did the Photoshop engineers remove the No Color Management (NCM) option from the Photoshop Print dialog? The NCM option was a non-sanctioned print path that was essentially a program hack to make it work. Current and future versions of operating systems' print pipelines have made that hack very susceptible to breaking with Operating System updates. As a result, Adobe decided to remove the option and in its place offer a free printing utility that can print color targets simply and easily. Figure 12.3 shows the difference between the Photoshop CS4 and CS5 versions of the Color Handling drop-down menu in the Color Management part of the Print dialog.

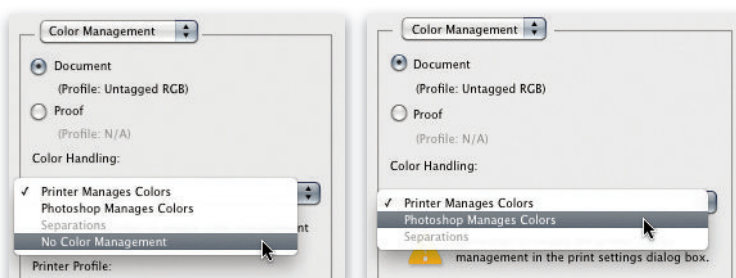
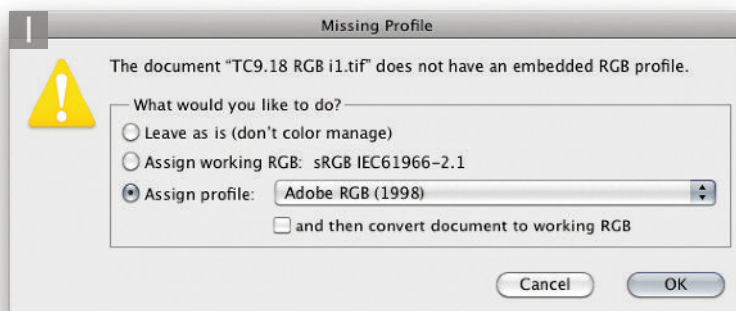


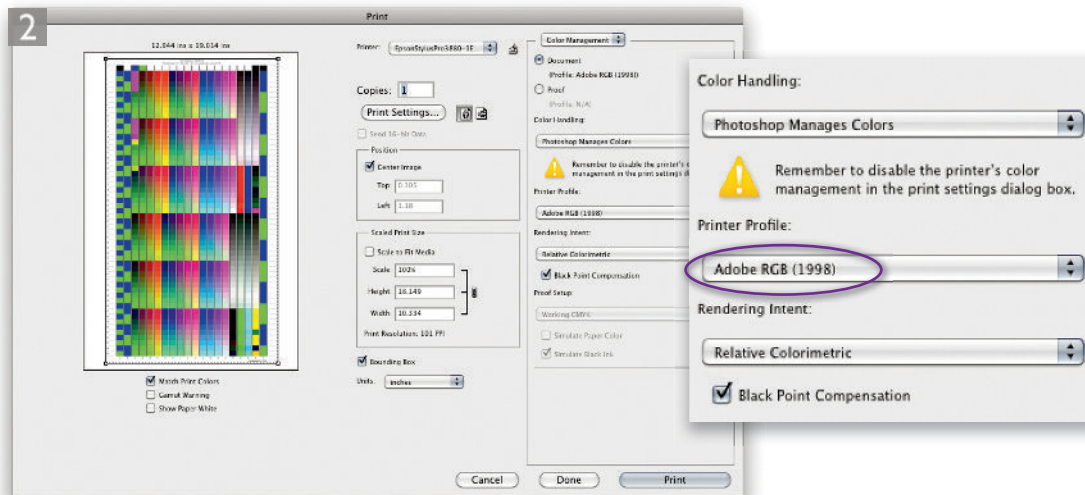
Figure 12.3 On the left is the Photoshop CS4 Color Handling drop-down menu. On the right is the Photoshop CS5 version.

Target printing workaround

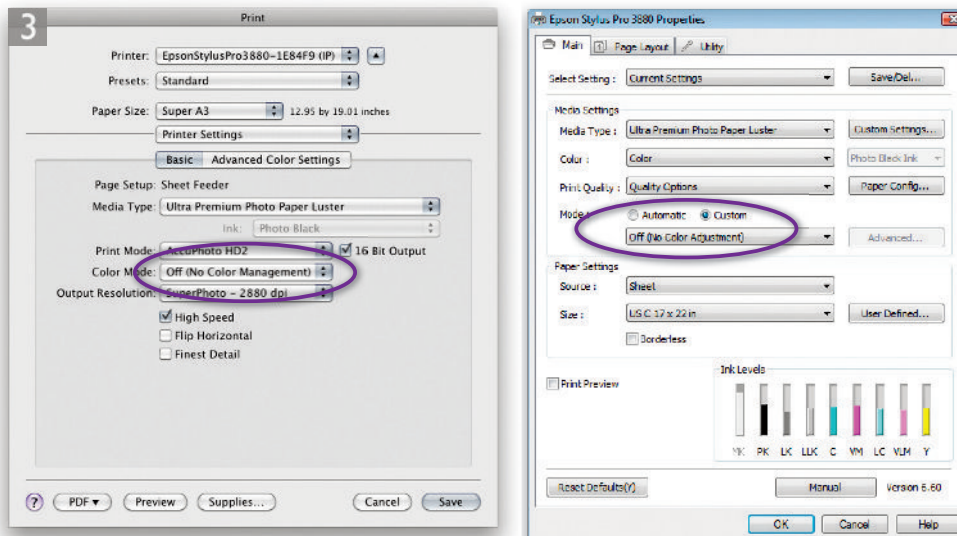
There is actually a sneaky way of correctly printing out color targets in Photoshop CS5 but at this point, it's not a 'sanctioned' method. It works, but it can be tricky and there's no guarantee it will continue to work in the future. But as a matter of addressing your intellectual curiosity, we decided to show you how to do it.

1 The first step was to open the target in Photoshop. Rather than checking the option to 'Leave as is (don't color manage)' you actually want to assign a working color space to the image. In this step, the only critical factor was to make sure I assigned a 'real' RGB working space. For this reason, I suggest using Adobe RGB (1998). You don't want to do a conversion and you don't want to alter the data, just what the data represents.





2 In Step 2, I went to the Photoshop Print command in the File menu. Here, I set the Color Handling setting to Photoshop Manages Colors, so that Photoshop, and the Printer Profile, were in the same color space I had assigned as the target image when I opened the file; in this case, Adobe RGB (1998). The result of setting the Printer Profile to the same profile assigned when opening the image was a null transform. This kept the OS level color management from trying to apply a generic color transform. Don't worry about setting the Rendering Intent; since the working space is considered a 'display space' the only rendering intent to use here would be Relative Colorimetric, which wouldn't actually transform the color data.



3 The next step was to set the print driver settings. Whether you are printing from Mac or Windows, the print driver must be set to your print driver's version of No Color Management. Once I had set up the driver, I clicked Save then Print in the Photoshop CS5 dialog.

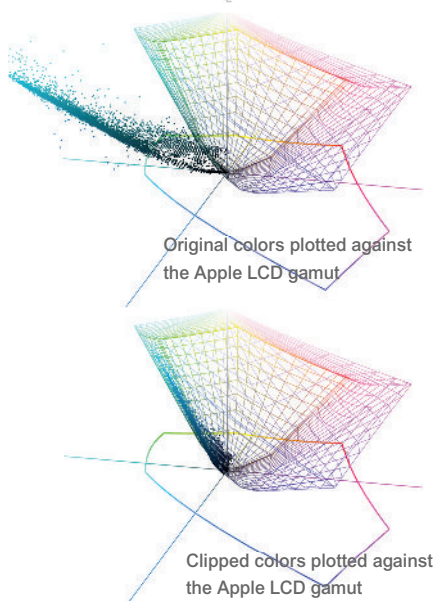


Figure 12.4 In this photograph I shot of Jeff, the vibrant colors contained in the ProPhoto RGB master far exceeded what could be displayed on the gamut of an Apple LCD display (represented here by the wire-frame shape). This is an example of where even a calibrated display cannot show the full color potential of an image in print.

Getting the most from your printer profiles

There is no such thing as a perfect color management workflow. Allowances will always need to be made for a small margin for error, but if you follow the guidelines carefully you should attain impressive results even from a modest desktop printer. To fully appreciate the printed results you really need an accurate light viewing box to view the prints correctly. Some inkjet prints can take a while to dry after they come off the printer. A print produced on older Epson printers can at first look quite green in the shadows, but after a few hours the ink colors will stabilize and the green cast eventually disappears. This is why you are sometimes advised to wait at least 24 hours before measuring your printed target prints. Then there is the issue of what is often incorrectly described as ‘metamerism’ (the correct term is metamer failure). This refers to the phenomenon where, when viewing under different lighting conditions, the ink dye/pigment colors will respond differently. This problem can be particularly noticeable when a monochrome image is printed using color inks. Although the color management can appear to be working fine when a print is viewed under studio lighting, if this environment is changed, and the print is viewed in daylight from a window, the print can appear to have a green cast. There was an example of this with the early Epson Ultrachrome 2000 printer where the pigment-based ink suffered from this green shift in daylight problem, but the latest Ultrachrome printers have now managed to resolve this problem.

Despite all your best efforts to produce a perfect profile, you may just find that a specific color on the display does not match exactly. I sometimes see this happening with the skin tones in a portrait. Although I usually obtain a perfect match with a specific ink and paper profile combination, the printed result is sometimes just a fraction out on an item of clothing or in the skin tones, but every other color looks just fine. This could indicate that it is time to recheck the monitor calibration or it could be that you need to adjust the printer profile. If you know what you are doing it is possible to tweak profiles using a program like X-Rite’s ProfileMaker Pro™. Another reason why there may be a difference in the colors seen is that the color gamut of the printer is not as large as the gamut of the display on which you are viewing the image (see Figure 12.4).

Display gamut versus printer gamut

It is important to understand that what you see on the computer display is always going to be a selective view of the colors actually contained in the image. A great many computer displays are effectively sRGB devices, while even the Adobe RGB gamut screens such as the Eizo CG301W and NEC LCD3090 30" displays may not be able to accurately display every color that your printer can print (although we still recommend these as the best tools for soft proofing). There was a time when this didn't matter so much, but some of the latest inkjet printers such as those made by Epson and HP have color gamuts that well exceed the limits of the average computer display. There is not much you can do to predict the color output of those colors that exceed the gamut limits of your display. If some of the colors you see in an inkjet print don't match those you see on the monitor and you are confident you have color managed everything effectively, this most likely points to the fact that the display isn't able to show some of the colors that will actually show in print (see Figure 12.5). You can't really do anything about this other than to invest in a good quality, large gamut display. But just be aware that what may appear to be color errors don't necessarily point to a failure in color management.

Soft proofing via the display

More often, the colors you see on the display may appear brighter than those you see in print because the tonal contrast range of the display is greater than what you see in print and this can have the opposite effect of making the print image appear dull in comparison to the image displayed on the display. The solution to this is to use soft proofing in Photoshop to simulate the output characteristics of the print output device on the display, as well as CMYK conversions destined to go to the press.

If you are editing an RGB image and go to the View ⇨ Proof Setup menu you'll see a list of proofing options. If you select Working CMYK this will allow you to soft proof an RGB image using the current CMYK space established in the Edit ⇨ Color Settings dialog (using the default rendering intent). If you choose the Custom... option this opens the Custom Proof Condition dialog shown in Figure 12.6 on the following page, where you can select any output profile that's available from your system color

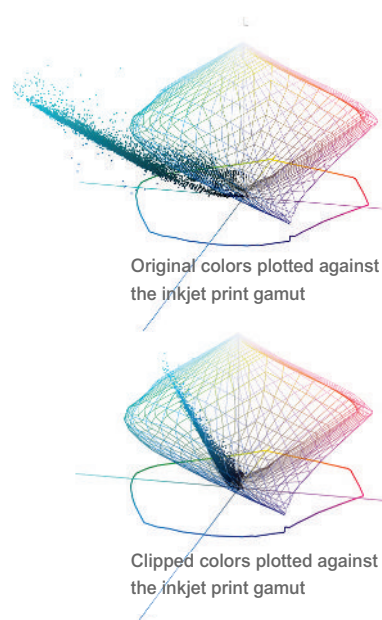


Figure 12.5 These two color gamut diagrams really follow on from the Figure 12.4 example because they show the actual colors in the original ProPhoto RGB image plotted against the wire-frame gamut of a glossy inkjet printer profile. Here you can see that while many of the ProPhoto RGB colors are still beyond the gamut of the print output, the print can still reveal much richer blues and shadow detail than can be revealed on the calibrated Apple display. As you can imagine, it's not possible to show in the book the colors that a modern inkjet printer can reproduce, but there was quite a difference.

profiles folder and use this to simulate the tone and color output characteristics of the print device on your monitor using different rendering intents.

You can then save a custom proof setting as a .psf file in the Users/Username/Library/Application Support/Adobe/Color/Proofing folder (Mac OS X) or the Program Files/Common Files/Adobe/Color/Proofing folder (PC). This saved proof setting will then be appended to the bottom of the list in the Customize Proof Condition dialog. That way you can quickly access the settings needed for simulated proof printing via the Proof Setup Preset menu in the Print dialog.

You don't have to keep returning to the Customize Proof Condition dialog. Once you have established a custom proof setting you can preview the colors in this space by simply choosing View ⇨ Proof Colors, or use the keyboard shortcut **⌘ Y** **ctrl Y** to toggle the preview on and off. This keyboard shortcut makes it very easy for you to switch from Normal to Proof viewing mode. The document window title bar will also display the name of the proofing space after the color mode such as: *RGB/Working CMYK*.

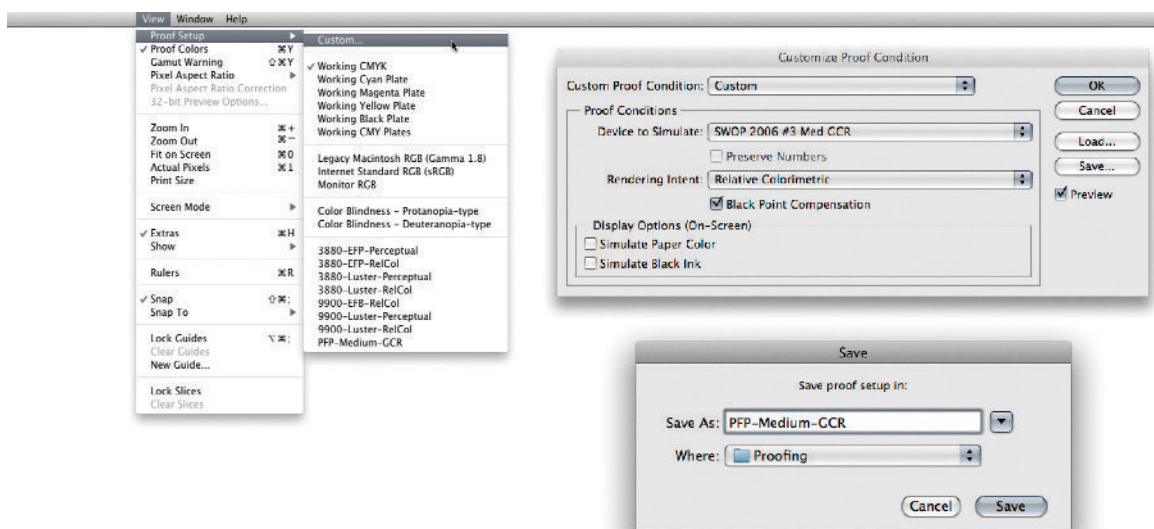


Figure 12.6 Use the View ⇨ Proof Setup menu to select the device or color space you wish to soft proof with, whenever the Proof Colors command **⌘ Y** **ctrl Y** is applied. If you click on Custom... this will take you to the Customize Proof Condition dialog, where you can select the profile of your printer or CMYK print output. In this example, I selected a custom CMYK profile for the book printers who are printing this book.

Display simulation options

Once you have established a proof setup and you select the Proof Colors option from the View menu, Photoshop takes the current display view and converts it on-the-fly to the destination color space selected in the Proof Setup. The data is then converted back to the RGB display space to form a preview using the relative colorimetric rendering intent and with black point compensation switched on. In simple terms, the image you see on the display is effectively filtered by the profile space selected in the Customize Proof Condition dialog.

The Proof Colors view provides you with an advance indication of how a file might reproduce after it has been converted to the print output space. The Proof Colors view may make the display image appear muted, but it does more accurately reflect the appearance of the final print output. However, the image on the display will still be optimized to the full contrast range of the display. This is where the Simulate Paper Color and Black Ink options come in (Figure 12.7). These allow you to achieve a more accurate simulation, one that takes into account the color of the paper and the black ink density. The Simulate Paper Color option simulates how the whites in the image will appear, by simulating the color of the paper on the display, and will use an absolute Colorimetric rendering to convert the proof color space data to the display space; it also auto-selects both the color of the paper and the black ink color density. However, the Paper Color simulation only works if the profile used is made on the actual paper stock used for printing, and only if this paper doesn't have too much optical brightener in it (otherwise the results will look bluish on the display – see side panel on page 438).

Turning these options on is equivalent to pressing the 'Make My Image Look Really Bad' buttons. Why? Because a computer display may have a 700 to 1 contrast ratio while a print may only have 200 to 1. Since white will be white and black will be black, the only way to predict the impact that the lowered contrast ratio will have is to make the image look dull and flat. It's accurate, mind you, but it is disappointing unless you know how to use it. So I follow Bruce Fraser's advice and try looking away from the display just prior to checking these press simulation settings. That way I don't see the image die in front of my eyes.

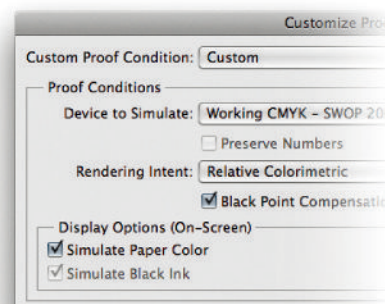


Figure 12.7 The Display Options in the Customize Proof Condition dialog allow you to achieve more authentic on-screen previews that take into account the density of the black in the final output being less black than the maximum black you see on the computer display. When the Simulate Paper Color option is selected the display image will simulate both the color of the paper stock and the black ink color. It is important to note here that while the Proof Condition settings for the Rendering Intent and Black Point Compensation have a bearing on a proof print output, the Simulate Paper Color and Black Ink options will only affect the display preview.

Preserve numbers

You use the Customize Proof condition to preview how a document will look before it has been converted to another color space. The Preserve numbers option can be useful for proofing how a CMYK file in a specific space will print if sent to a known CMYK space. By preserving the numbers you can simulate how a file will print before you consider reseparating it. If the destination space is in the same color mode as the source space (i.e. RGB or CMYK), the Preserve Numbers box allows you to preview how an image would look without a profile conversion.

Inkjet paper optical brighteners

The optical brightener additives contained in many of today's inkjet papers can also bring about quite a noticeable shift in the way a print is perceived under different lighting conditions. If there is a high amount of UV light present the whites will look much brighter, but also bluer compared to a print that has been made using a paper stock such as GMG Premium Proofing papers, which are ideally suited for CMYK proof printing and viewed using controlled lighting with a color temperature of 5000 K.

The Simulate Black Ink option simulates on the display the actual black density of the printing press by turning off the black point compensation in the conversion from the proof color space to the display color space, thus simulating the 'ink on paper black'. Checking both these options allows you to see, as accurately as possible, an on-screen representation of how an image will look when printed. Figure 12.8 shows the results of having the Display Options on and off.



Figure 12.8 On the top is the soft proofed image using the PFP-Medium-GCR proof setup with the Display Options for Paper White and Ink Black off. The figure on the bottom has the options for both turned on.

CMYK output

Color proofing for press output

If you are supplying digital files for CMYK halftone reproduction, then you will want to obtain as much relevant information as you can about the press, paper stock and print process that will be used to print a job. Good luck with that because it doesn't happen often as sometimes the end press and paper won't yet be determined. But if the pre-press people you are communicating with are cooperative and understand what you are asking for, they may be able to supply you with a suitable proofing standard ICC profile, or they can provide you with information about the printing inks and other specifications used for the press. Go to the Edit ⇒ Color Settings ⇒ Working Space ⇒ CMYK ⇒ Custom CMYK dialog, and enter these settings as shown in Figure 12.9. Once you have saved this as a CMYK setting you can convert your RGB image to this custom CMYK color space and save it as a TIFF file.

A CMYK file on its own is not enough to inform the printer how it should look when printed. It is standard procedure to supply a targeted CMYK aim print or proof along with the image, as this will provide a guide as to how you expect the picture to reproduce in print within the gamut of the specific CMYK print process. The term 'contract proof' is used to describe a CMYK proof that has been reproduced using an approved proofing device. These include the Epson x880 and x900 series with a good proofing RIP like the ColorBurst™ RIP. Kodak Approval™ is still much used, and perhaps to a lesser extent DuPont™ Chromalin™.

Inkjet printers are essentially taking over the proofing industry, as many press houses move to Computer to Plate (CTP) technology, thus eliminating the need for film at the proofing stage. The contract proofing devices benefit from having industry-wide recognition, and if the proof that accompanies the file is generated using an approved contract device, a designer can use an aim print to pass off a job to the pre-press company handling the repro. A proof print is more likely to be accepted as a valid target print representing the colors that are achievable on the press.

Realistic proofs

When you supply a CMYK proof you are aiming to show the printer how you envisage the picture should look in print. A proof is a print that has been produced using the same color gamut constraints as the halftone CMYK process. That way the printer will have an indication of what colors they should realistically be able to achieve. However, you should not confuse a really nice fine-art print with a maximum gamut print made from an RGB file as a realistic proof. The colors in such a print simply can't be reproduced on press. Only a cross-rendered CMYK proof will represent a reasonable expectation of what the image will look like when printed.

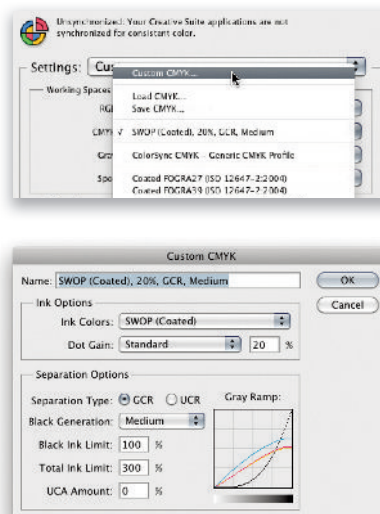


Figure 12.9 In the Photoshop CS5 Color Settings dialog in the edit menu, click on the CMYK Working Space (top image), select Custom CMYK (bottom image) and enter the numbers provided by the pre-press people.

Contract proof versus aim print

The term 'aim' print most justly describes the appropriateness of a standard profiled inkjet output, when used as a guide for the designer or pre-press person who is determining how the colors in an image will reproduce when using CMYK inks on the actual press.

Rendering intent grayed out

When Proof is selected as the source space, the Rendering Intent will be grayed out and the Black Point Compensation automatically switched off. This is because Photoshop will use the rendering intent that is applied in the custom proof setup.

CMYK proofing with an inkjet

Even a humble inkjet printer is capable of producing 'targeted' CMYK prints that can be used as 'aim' prints or even as contract proofs (if produced via a RIP), because it is possible to simulate the restricted CMYK gamut of the press via the Photoshop Print dialog. Figure 12.10 shows the Photoshop print dialog for a ProPhoto RGB image. When the Proof option is selected as the Print space, the Proof Setup is invoked below and the default Proof Setup will use the current CMYK work space. The Photoshop Manages Colors option should be selected so that you can select a printer profile for the printer. In the Proof Setup you can then also select a saved Customize Proof Condition preset for the print process you wish to simulate (which includes the chosen Rendering Intent) and use the two check boxes below to simulate the press conditions, using: Simulate Paper Color and Simulate Black Ink.

Simulation and rendering intents

The aim here is to produce a print that simulates the output of a CMYK proof printer. We are configuring the Photoshop print dialog settings to utilize the Customize Proof Condition settings (which will already include the device to Simulate and the Rendering Intent) and then applying a further profile conversion from this proof setup space to the printer profile space. Photoshop makes it easy for you to select the right options so that you don't have to do anything more than decide whether you wish to simulate the black ink appearance only or simulate the paper color (in which case the simulate black ink will be checked automatically anyway). So by clicking on one or more of these buttons at the bottom, you can instruct Photoshop to work out for you how the data should be converted and sent to the printer to achieve the desired press simulation.

When Simulate Paper Color is selected, the whites may appear duller than expected. This does not mean the proof is wrong, rather it is the presence of a brighter white border that leads to the viewer regarding the result as looking inferior. To get around this try adding a white border to the outside image you are about to print. When the print is done, trim away the outer paper white border so that the eye does not get a chance to compare the dull whites of the print with the brighter white of the printing paper used.

When you hit the Print button, the same routine should be followed as usual. If you are using Photoshop to manage the colors, the system print settings should have the color management switched off and the Print Settings should match the paper type used, or you should select the saved print preset that was created for use with the custom printer profile.

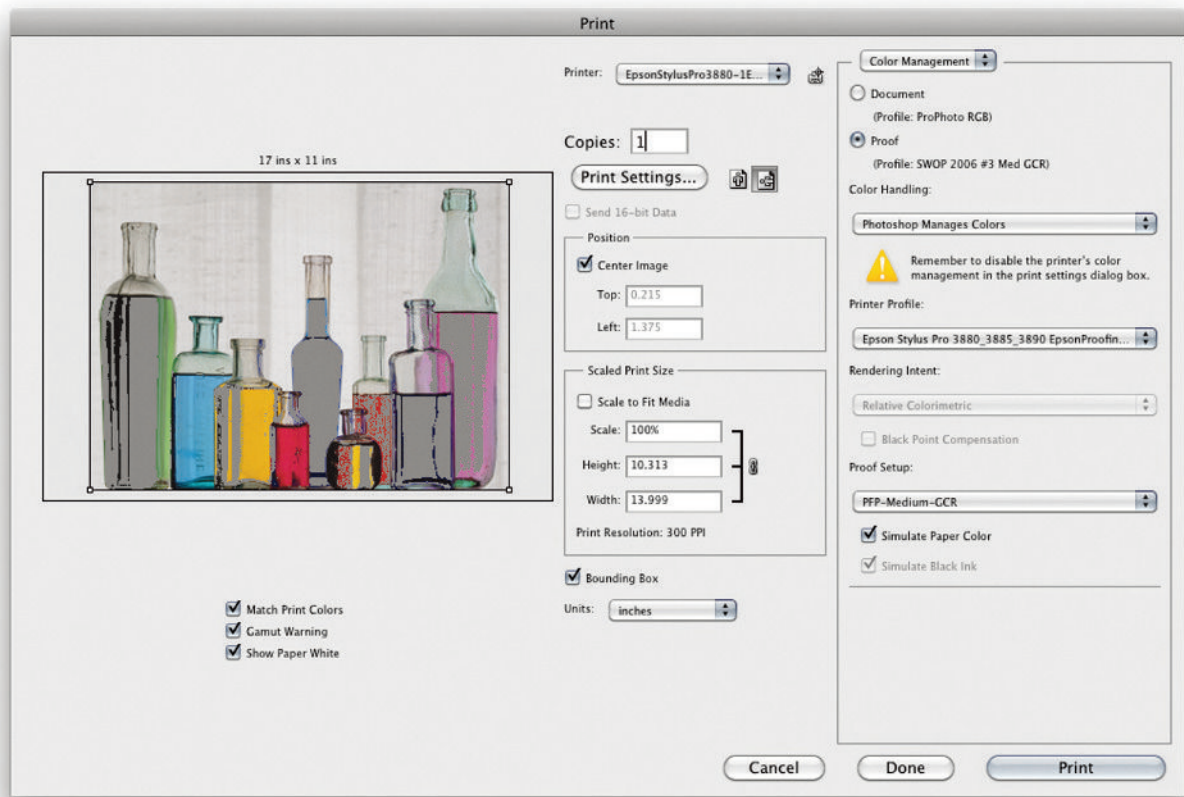


Figure 12.10 Here, the Print dialog is configured for making a cross-rendered simulated CMYK print. The options for Match Print Colors, Gamut Warning and Show Paper White are selected, but there's not much you can do about the result. Ideally you should take care of that in soft proofing. Note that the Proof not the Document working space is set at the top of the Color Management settings. At the bottom, the Proof Setup is showing the same soft proof setup we previously saved. Before hitting Print, you would need to be sure to click on Print Settings and select the system print driver setting that matches the selected printer profile and media. In this case, I am going to be proofing the image on my Epson 3880 printer using Epson's Semi-matte Proofing Paper.

What flavor of CMYK?

Often photographers are simply told 'give me a CMYK file', but not all CMYK files are really equal. For magazine repro using a web press in the US, Photoshop's default CMYK profile is OK. It really is, but one can do a bit better. If the image is intended for small run sheetfed printing, the problem gets a bit more difficult. You can try to get an ICC profile from the printer (good luck) or the alternative is to have a client specify exactly what proofing system will be used. If you can determine that, then you can separate for the proof and not the press. I have required that clients provide the exact proofing system that will be used on purchase orders before accepting a job. Since I have profiles for pretty much every proofing system out there, I can both soft proof and do the final RGB to CMYK conversions for the actual proof.

Preparing files for output

Any RGB image destined for CMYK halftone reproduction will need to be converted to CMYK by somebody, at some time. The big question is by whom? The photographer? The art director or designer (we doubt that), or the pre-press or printer that will be doing the output? The 'best' answer to the question is whoever can do it in an optimal manner. This could be the photographer or the printer. The circumstances really dictate who will be the most likely.

If the photographer is shooting an assignment where their job is to turn over many images that will end up being selected by somebody way down the road and retouched by somebody else, the odds are it won't be the photographer. Optimizing images for RGB to CMYK conversion takes time and effort to do well. So, unless the assignment is for a few select final images the pre-press provider or printer will probably do the CMYK conversions.

If you are a photographer who can control the final selection of images in concert with the art director or designer (and get paid to do the imaging and final conversions) then you would probably be the best person to do the conversions. You know what the image is supposed to look like and optimizing the RGB images and doing the CMYK conversions isn't really all that hard. It does take some effort and technique. First and foremost is knowing how to use soft proofing to predict what the image will look like and knowing how to take steps to improve the CMYK conversion. That's what we'll try to get across in this section.

The first thing we'll tell you is that it's wise that you never show your clients what your RGB images look like. Since it's a look they'll never be able to get on press, you really should only show them the images after you've already turned on CMYK soft proofing. You can defer the Display Options for paper white and black ink as you wish, but you really should not let them fall in love with the RGB colors from the beginning.

The second thing we'll tell you is that the old Gamut Warning under the view menu is pretty much useless for optimizing CMYK conversions and may actually lead you astray. It has some limited usefulness – most notably as a front end to the ability to select out of gamut colors using Color Range as shown in Figure 12.11. The problem with this approach is that you don't know how much out

of gamut a color or tone will be, just that it's out of gamut. It also doesn't show you what the result will look like. For this reason we don't suggest using Gamut Warning but instead suggest learning how to use soft proofing.

We've already talked about using the Customize Proof Condition dialog and how to configure it for your use. The following series of steps shows how to use it to optimize a colorful ProPhoto RGB image for CMYK. There are some hard limits in doing this in the book. For one thing, we can't show you what the ProPhoto RGB image actually looks like because the book is, of course, CMYK. So, the steps show the 'relative' relationship between ProPhoto RGB and the CMYK conversion we are using for the book separations which were provided by Chris Murphy, co-author of *Real World Color Management*. More info about Chris is at his web site (www.colorremedies.com). However, we will make the original ProPhoto RGB file as well as the CMYK conversions available on the DVD so you can see for yourself how the images were optimized and try it for yourself. The other thing we need to tell people is that the graphic arts industry varies considerably by country and region. Martin has experience in the UK and Jeff in the US, but every country's printing industry operates by slightly different rules and practices. You really need to get to know your own printing industry's expectations and how best to provide them with the optimal CMYK images for their process.

What we'll show you here is what has worked for us over the years. There's no guarantee it'll work for everybody in every situation. The best thing to do is communicate with your client and their printers and gain experience of your own. The big part of learning how to do RGB to CMYK separations is actual practice and experience. We realize that's something that's not always easy to do 'on the job', but everybody had to start at the beginning at some point.

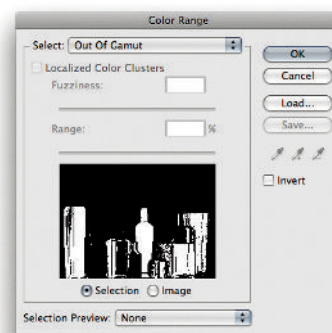
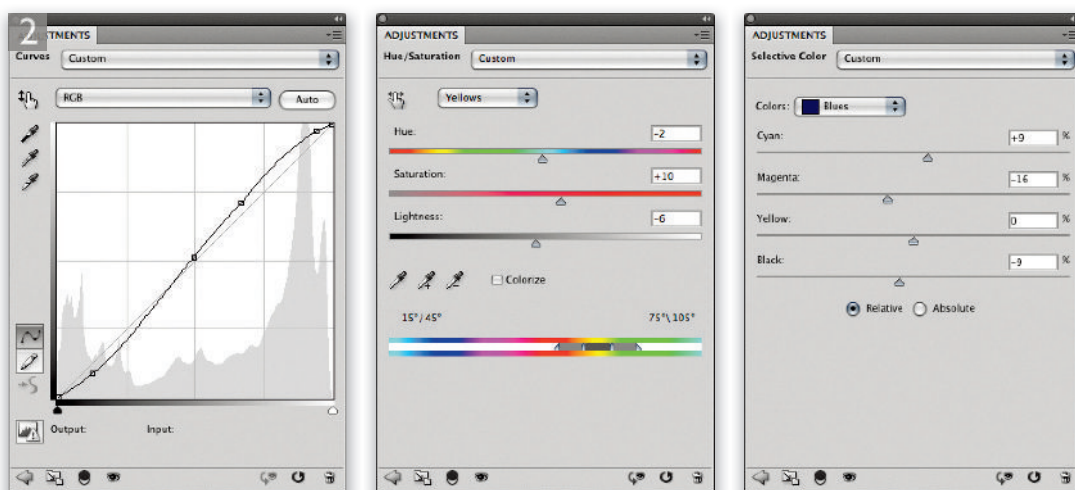


Figure 12.11 The Gamut Warning command is not really recommended. Its primary usefulness is as a method of making a selection based on the out of gamut color in Color Range (middle figure above). The problem of what to do to address the Gamut Warning still remains. Should you reduce the color saturation to the point where the warning essentially goes off, you'll end up with a very weak CMYK image as shown in the bottom figure.



1 I started here by opening an RGB image and making a duplicate. Above, the original ProPhoto RGB image is on the left with soft proofing already turned on. I chose to use Relative Colorimetric as the rendering intent. The copy without soft proofing is on the right. This image is a temp image used to provide a guide to what the image should look like. It will never match the color and dynamic range of this copy because the CMYK gamut is so small and halftone repro is such a lowered contrast range process. But I needed something to aim for.



2 To properly address both the color and contrast range of the CMYK limitations, I needed to use three sets of adjustments. The important tone curve adjustment is shown above. In addition to the Curves adjustment, I made a Hue/Saturation adjustment to tweak the overall saturation of the image up and individually adjust the Yellows: -2 Hue, $+10$ Saturation and -6 Lightness. The other important color was the Blues, where I did -7 Hue, $+14$ Saturation and $+13$ Lightness. The final Selective Color adjustment (the only adjustment for RGB files that give CMYK controls) tweaked the Blues again as well as Black increases in both the Neutrals and Whites drop-down options. Selective Color is a critical tool for doing CMYK style correction on RGB images.



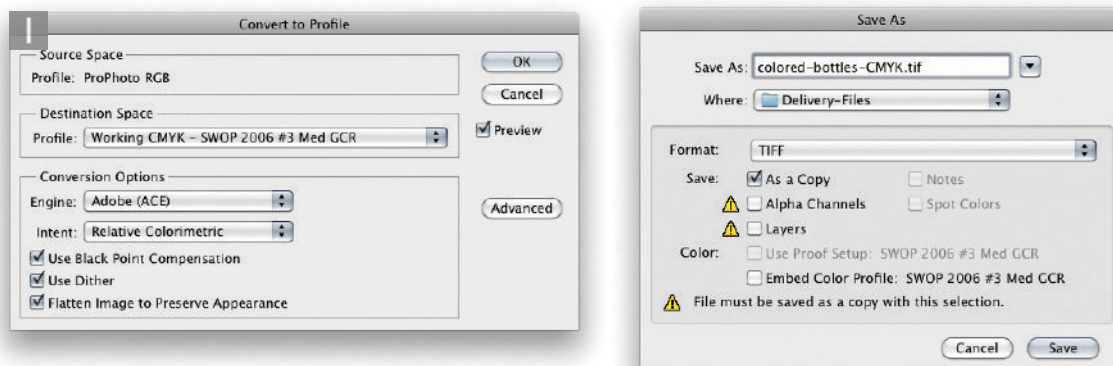
3 The above image shows the actual CMYK file made from the original ProPhoto RGB image without doing any soft proofing tweaks. It looks OK but is flat with dead blues.



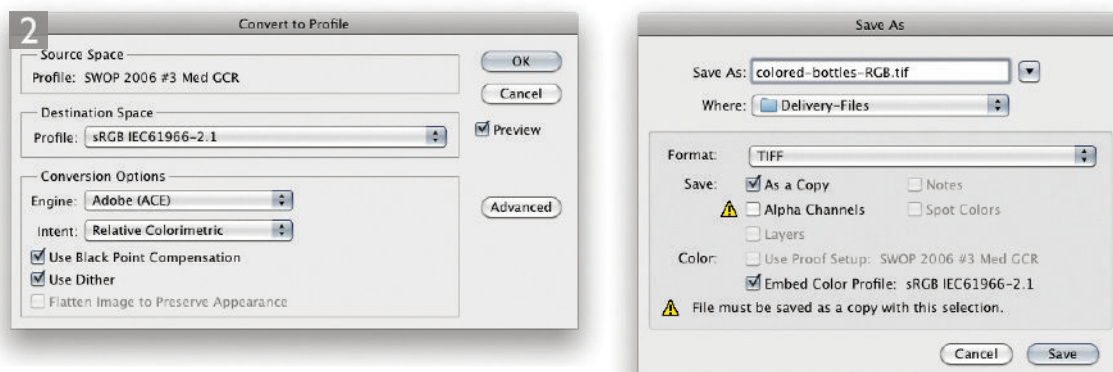
4 The image above is the one that was soft proofed and with the Curves, Hue/Saturation and Selective Color adjustments. You can see the impact that the adjustments had. No, it doesn't look as 'bad' as the soft proofed image in Step 1. Remember, all we can actually show here in the book are 'relative' differences.

Delivering files for output

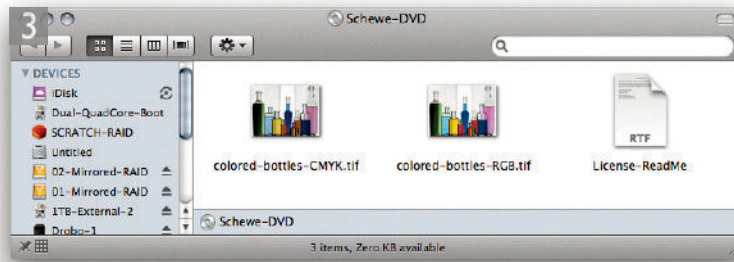
You might think that simply saving a CMYK file and giving it to the client is sufficient. It would be in an ideal world, but we live in the real world. You need to take some extra steps to ensure that your carefully prepared CMYK files don't get screwed up.



1 I use Convert to Profile rather than simply doing a mode change. Why? Because Convert to Profile allows explicit confirmation on the profile being used and the Rendering Intent (which I determined should be Relative Colorimetric). When saving, I use the TIFF file format and choose not to embed a profile. Why? Embedding a CMYK profile might lead a printer to do something and most of those things will be wrong. By not embedding the profile, I ensure that the printer will just use it without doing anything (like ignore the embedded profile or convert to some other profile). I also remove any layers and channels.



2 The next thing I do (because clients almost always ask that I also supply RGB files) is that I take the CMYK image and reconvert to back to RGB. Why? Well, we never give clients layered ProPhoto RGB images because most people don't know how to use color management and ProPhoto RGB looks pretty bad unless you use the embedded profile (very dark and green). So, I use the fact that the CMYK image has already undergone the worst color change of its life and preserve that CMYK gamut when converting back to RGB. In this case I used sRGB, but depending on the client I might be inclined to give them Adobe RGB. You'll note I have included the sRGB profile in this file — you really don't want any untagged RGB files around!



3 The last step is to burn a DVD (or CD if the files are small enough) for delivery to the client. The DVD always has a License-ReadMe file outlining use. Why a DVD? Because while expediency may demand a file be uploaded or transmitted via the net, a file delivered in that manner may be altered or otherwise changed (read screwed up) by somebody downstream. If that file is considered your contractual 'deliverable' then it becomes a difficult situation trying to prove exactly who screwed up the file since it has no provenance. By requiring the physical delivery of a read-only medium as the final deliverable, you can always have the client refer back to the DVD as proof of the state of the file when delivered. This has saved me in several situations where the blame game was being played and my client actually appreciated the fact they had a physical file that represented the state of the file prior to giving it to the pre-press provider. It actually saved the client some time and money by being able to prove that neither I nor the client had screwed up the file.

Is CMYK for you?

As you can see, there's more to making a good CMYK image file than just doing an Image ⇒ Mode ⇒ CMYK Color command in Photoshop (although, truth be told, that's the way a lot of people in the graphic arts treat the conversion). Is it worth all the time and hassle? Only you can say... but even if you decide you would rather simply provide sRGB or Adobe RGB files and let the client or the printer deal with the problem (we still don't think you want to give ProPhoto RGB images out), you can still take steps to make sure the images you provide are still the best suited for CMYK conversion down the road. You still need to evaluate the images under relevant CMYK soft proofing conditions and make adjustments for the impact of the CMYK conversion later.

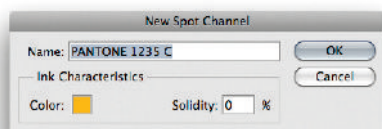
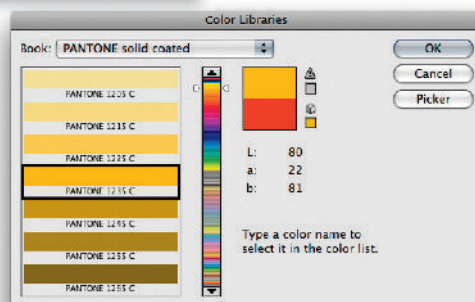
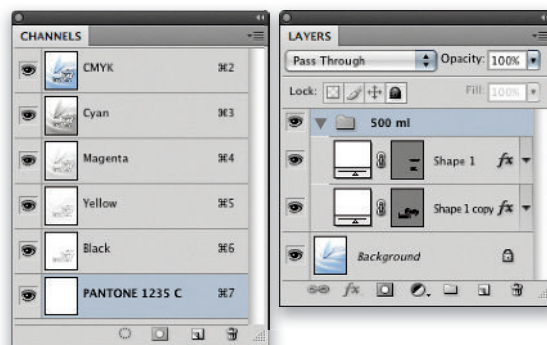
One aspect of the CMYK question is that of economics. Clearly, doing the conversions for free would not be good business – a topic we'll address in the next chapter. But there is an economic incentive to do the work if you can do it well (and be well paid for it).

Process color limitations

A four-color process mix can be used when printing larger sans-serif type using large point sizes, but not when printing fine type and line diagrams, as the slightest misregistration could make the edges appear fuzzy when printed. This is one example of where the use of spot colors is to be recommended.

Spot color channels

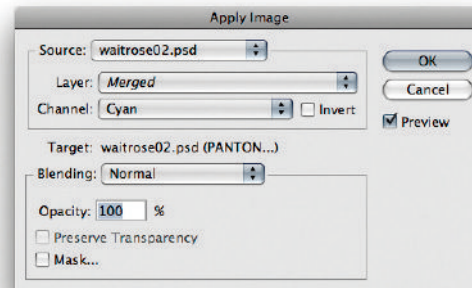
Spot colors can be added to images as part of the graphic design when you need to add a specific process color in addition to the standard CMYK printing inks. Photoshop is able to simulate the effect of how a spot color will reproduce in print and how a special color overlay will interplay with the underlying image. Spot colors include a wide range of industry standard colors. The colors available can include those found in the CMYK gamut, but also a whole lot more that are not, including metallic ‘specials’ (manufacturers’ printed book color guides are an accurate reference for how the color will print). Spot colors are mostly used where it is important that the printed color conforms to a known standard and for the printing of small point size type and graphics in color.




1 A spot color channel can be used to add a fifth color to a CMYK file. This master image contained some shape layers based on artwork supplied by the designer, to which I added a drop shadow effect. To add the Spot color channel, I went to the Channels panel fly-out menu and chose New Spot Channel... which popped the New Spot Channel dialog. I clicked on the swatch color to open the Color Picker and then clicked on a button marked Color Libraries. A quick way to select a known Pantone reference color is to rapidly type in the Pantone reference number.



2 I wanted to use the new spot color to add color to the fabric, but not the iron. I drew a path to define the area outside the iron, made an inverse selection and feathered the selection. I activated the new Spot channel and used Image ⇒ Apply Image to blend the selected Cyan channel contents into the Spot color channel using a Normal blend.

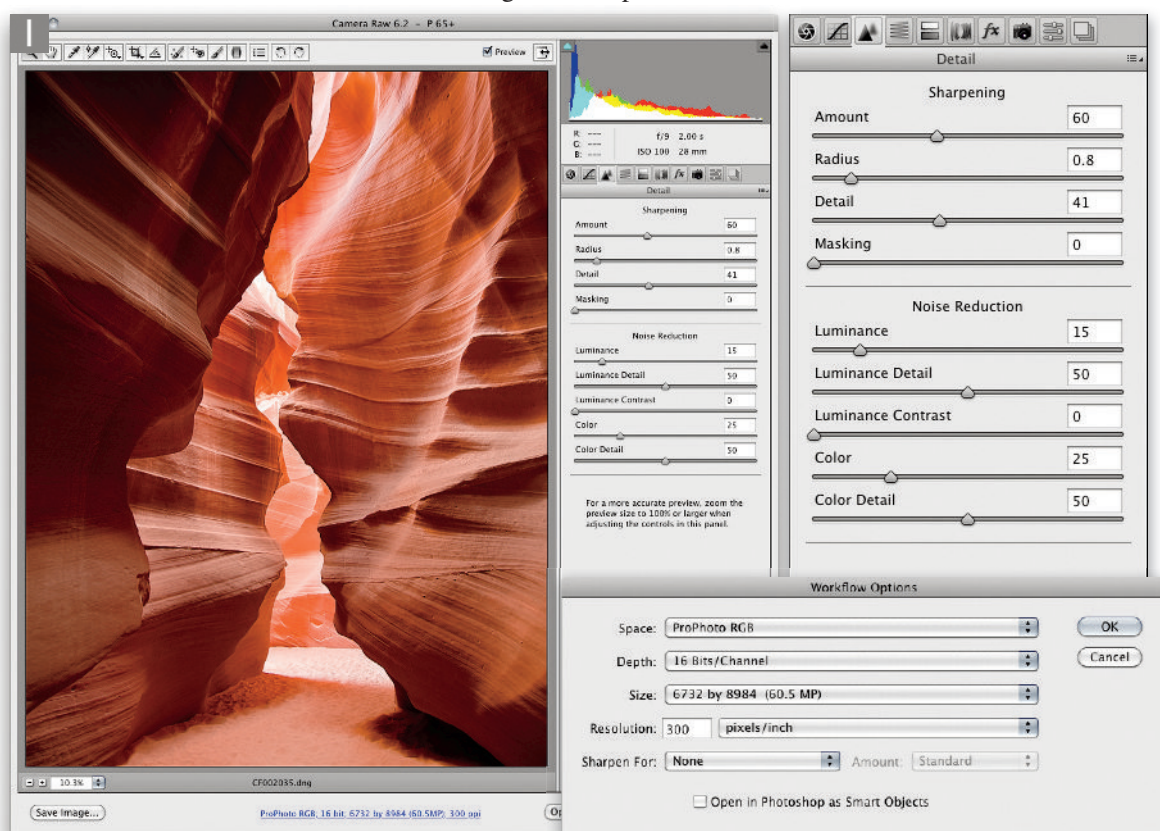


3 Meanwhile, with the selection still active in the Cyan channel, I used  **Delete** (alt + Delete) to fill the selected area with white. I then did the same thing in the Magenta channel as well. There now remained a CMYK full color image of the iron, but the fabric and lettering outside of the iron was now using the yellow, black and spot color channels only. To preview all of the color channels combined, I clicked on the composite channel and the Spot color channel eyeball icons. The client wanted the drop shadow lettering to predominantly use the spot color ink. I therefore had to make an inverted selection of the iron in the Black channel and apply a Levels adjustment to substantially lighten the lettering in the Black channel. Here is a screen shot of the image which shows the final result after I had basically taken the image information from the darkest channel (the Cyan channel) and copied this over to the new Spot color channel.

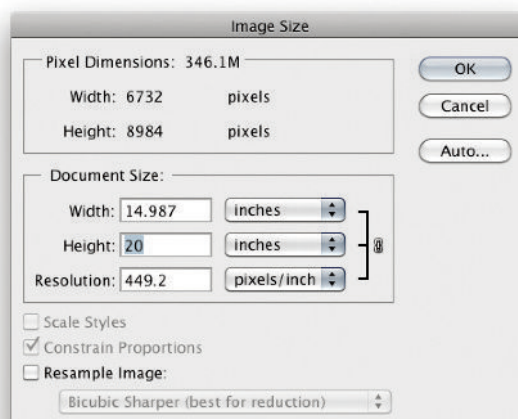
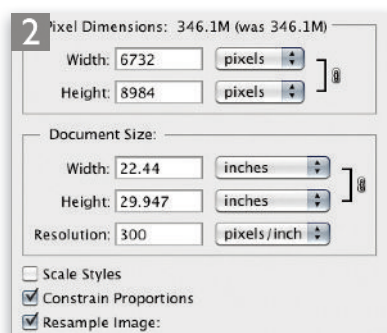
Photograph: Laurie Evans. Designer: Richard Lealan. Client: Waitrose Limited.

Fine-art printing workflow

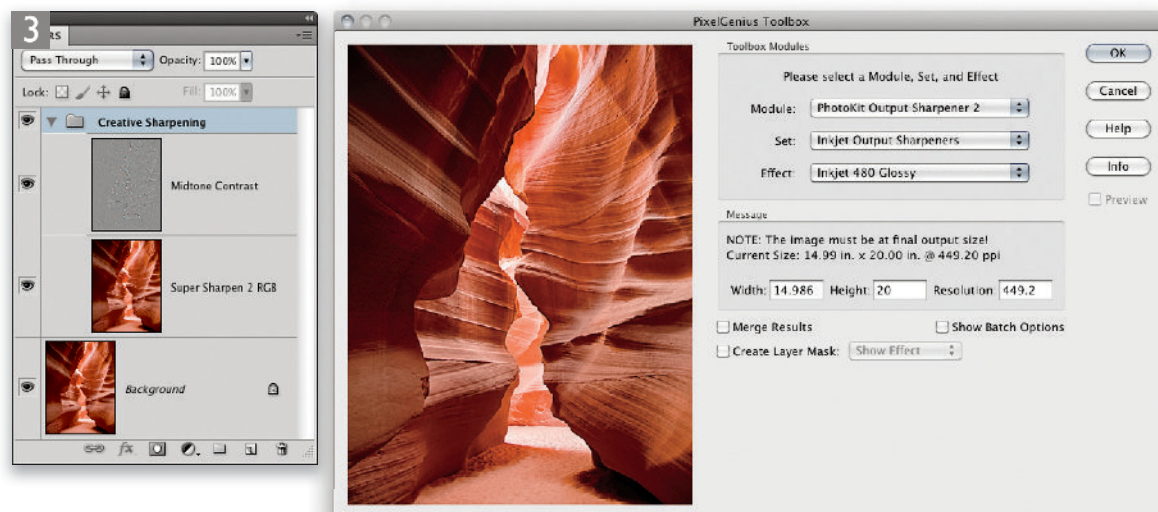
Opening an image in Photoshop and simply clicking the Print button may get you a reasonably acceptable print, but the odds of that print exhibiting a high degree of craft is pretty low. Making excellent prints from Photoshop is a craft that demands attention to detail and an understanding and appreciation of the process. It's much more than just hitting Print. In this section I'll try to give you the culmination of image processing and printing that we use when making 'serious' prints.



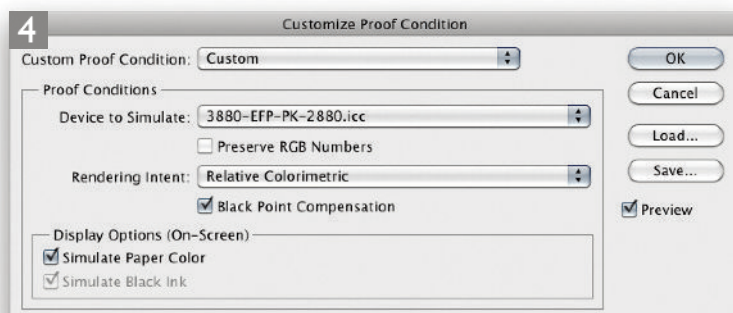
1 The process began in Camera Raw where both the tone and color were optimized for a 'master image' (not yet optimized for output). I also used Camera Raw's capture sharpening and noise reduction to get the initial detail extraction from the capture. I also set the color space to ProPhoto RGB, 16-bits and the native size of the capture. This image was shot in Upper Antelope Canyon just outside Page, Arizona, where I used a Phase One 6 x 4.5 camera with a 28 mm lens and the P 65+ camera back on a tripod with remote release. The exposure was about 8 seconds at f/11.



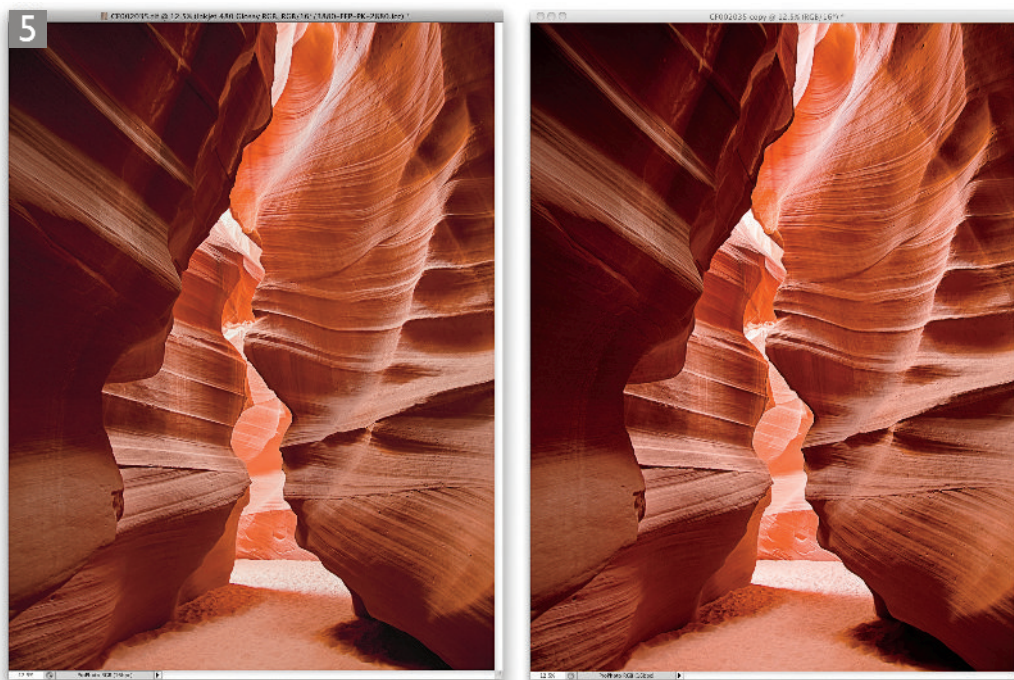
2 One of the limitations of Camera Raw's Workflow Options is the inability to control image dimensions, just resolution. Therefore, the image was opened into Photoshop at 300 PPI knowing that the height would be wrong since the image height was 29.947" at that resolution. In this step I used the Image Size dialog to change the height to 20" while letting the Resolution fall where it may since the Resample Image option was unchecked.



3 The next step was to do a final output sharpening for the print. I used Pixel Genius' PhotoKit Sharpener 2's Inkjet 480 Glossy setting as I was planning on making the print on Epson Exhibition Fiber Paper, which is a glossy type paper. I also added a bit of midtone contrast to punch up the midtone textural detail. I often slightly under-adjust the Clarity slider in Camera Raw so I can add additional midtone contrast in Photoshop, where the radius of the High Pass filter can be adjusted along with the blending options.

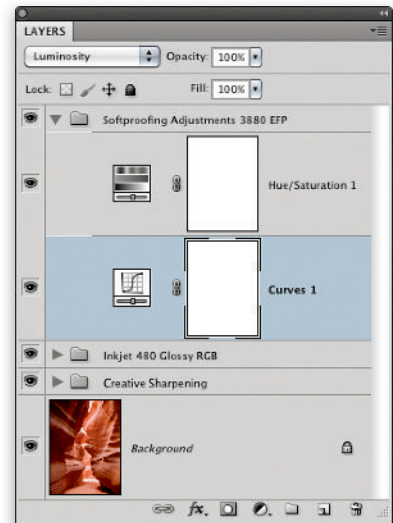
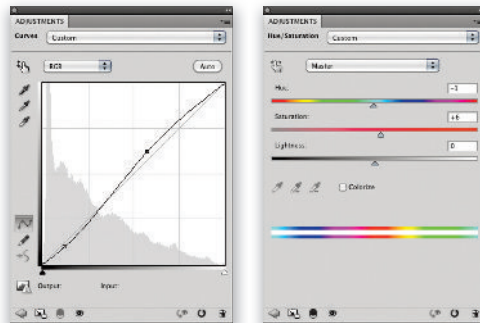


4 After getting the tone, color and detail adjusted for our master image, it was time to tweak the image based upon soft proofing the image through the veil of our custom printer/paper profile. It is at this stage where you'll need to evaluate which rendering intent is optimal for your image. In this image, I decided that Relative Colorimetric was better than Perceptual. After clicking OK, the image on-screen flattened out and appeared duller than without the soft proofing. That was because I had the Display Options (On-Screen) turned on.



5 Soft proofing does show you what the image will look like if you print it. However, it doesn't really give you any guidance in terms of adjustments you may need to make to improve the image. For that, I made a duplicate of the image and turned soft proofing off on the duplicate. Above, the original soft proofed image is on the left, on the right is ideally what I want the image to look like. The duplicate was my aim point.

6

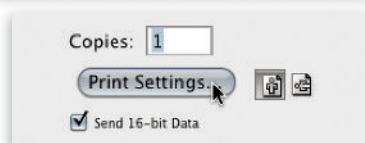
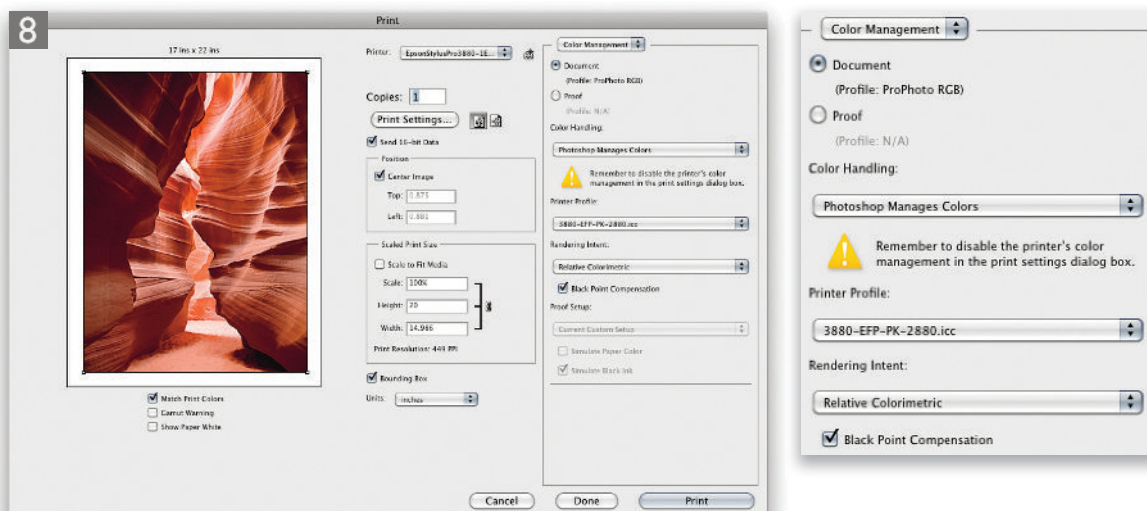


6 Soft proofing shows what the image will look like when the ink hits paper. By using the un-soft proofed image as an guide. I find that there will be at least two tone and color tweaks you'll need to make: a Curves and a Hue/Saturation adjustment, as shown above. The Curve adjustment, set to a Luminosity blend, only changes the image's contrast range to appear less dull. The Hue/Saturation tweak warms up the color and adds saturation. Both of these adjustments are placed inside a layer group named to represent the print and paper the adjustments are intended for. Obviously, you would only turn this layer group visibility on when you wanted to print to this printer/paper combo.

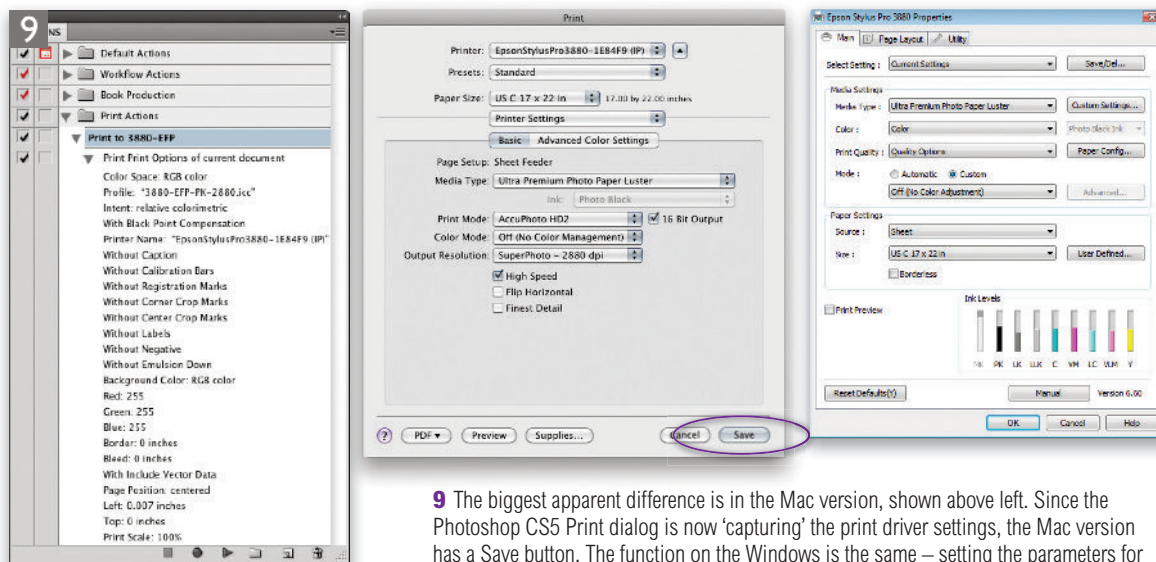
7



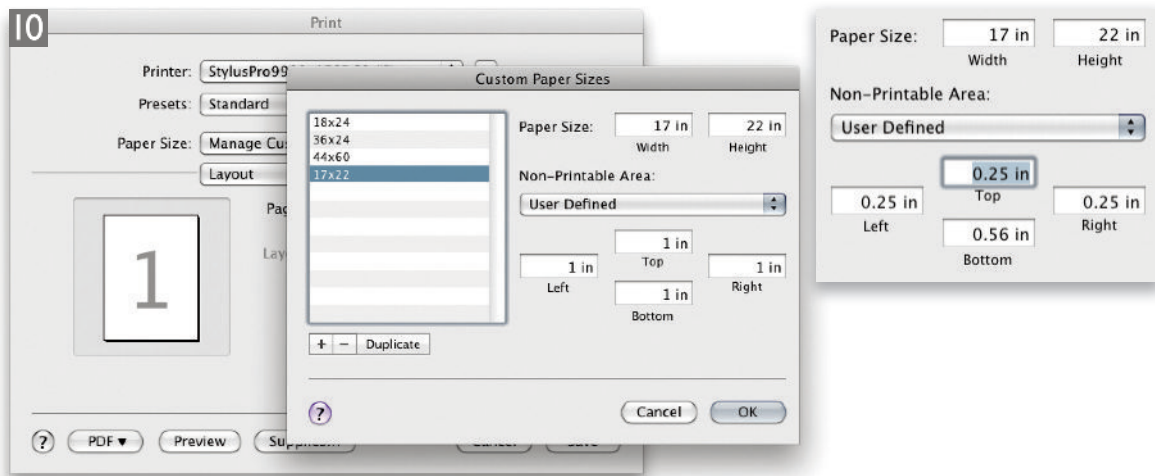
7 The image on the left (the soft proofed image) with the tone and color tweaks now appeared to be a better match to the duplicate, un-soft proofed image on the right. Perfect? No. Better? Yes, and that's really what I am striving for, better. At this stage I would normally close the duplicate without saving and go to print out the final image.



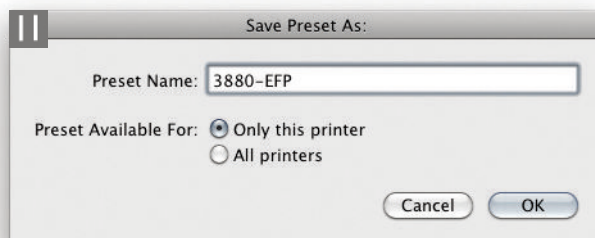
8 The Print dialog of Photoshop CS5 has changed visually only a slight amount from CS4 and earlier, yet the change in functionality is significant. The Color Management handling remains essentially the same (minus the NCM option). Here, I selected Photoshop Manages Color and our custom paper profile named 3880-EFP-PK-2880.icc. The big differences in CS5 really come from the elimination of Page Setup in the main File menu and incorporating that functionality in the Print Settings... button.



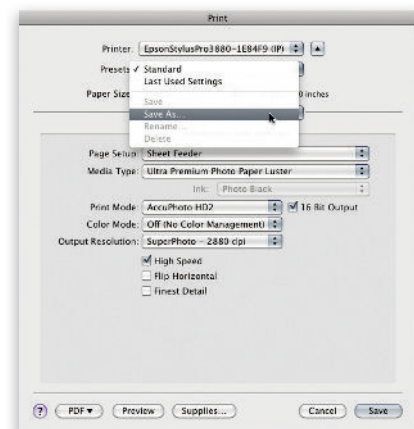
9 The biggest apparent difference is in the Mac version, shown above left. Since the Photoshop CS5 Print dialog is now 'capturing' the print driver settings, the Mac version has a Save button. The function on the Windows is the same – setting the parameters for paper and driver settings is stored and sticky in the Print dialog. Hitting the Print button in the CS5 Print dialog now bypasses the print driver and uses the settings already captured. You can even record an action for printing – it even captures the parameters from the Print Settings dialog!



10 One of the more irritating aspects of some printers is the inability to default to four equal margins. Many inkjet printers need a larger margin where the gripper grabs the paper. In reality this is actually a legacy issue since many printers can make borderless prints. But if your printer has unequal print margins, you can select the custom paper size and create your own size and margin settings. Generally, I prefer to always leave at least a 1" paper margin for paper handling. In this step I created a custom paper size of 17" x 22" and four equal 1" margins.



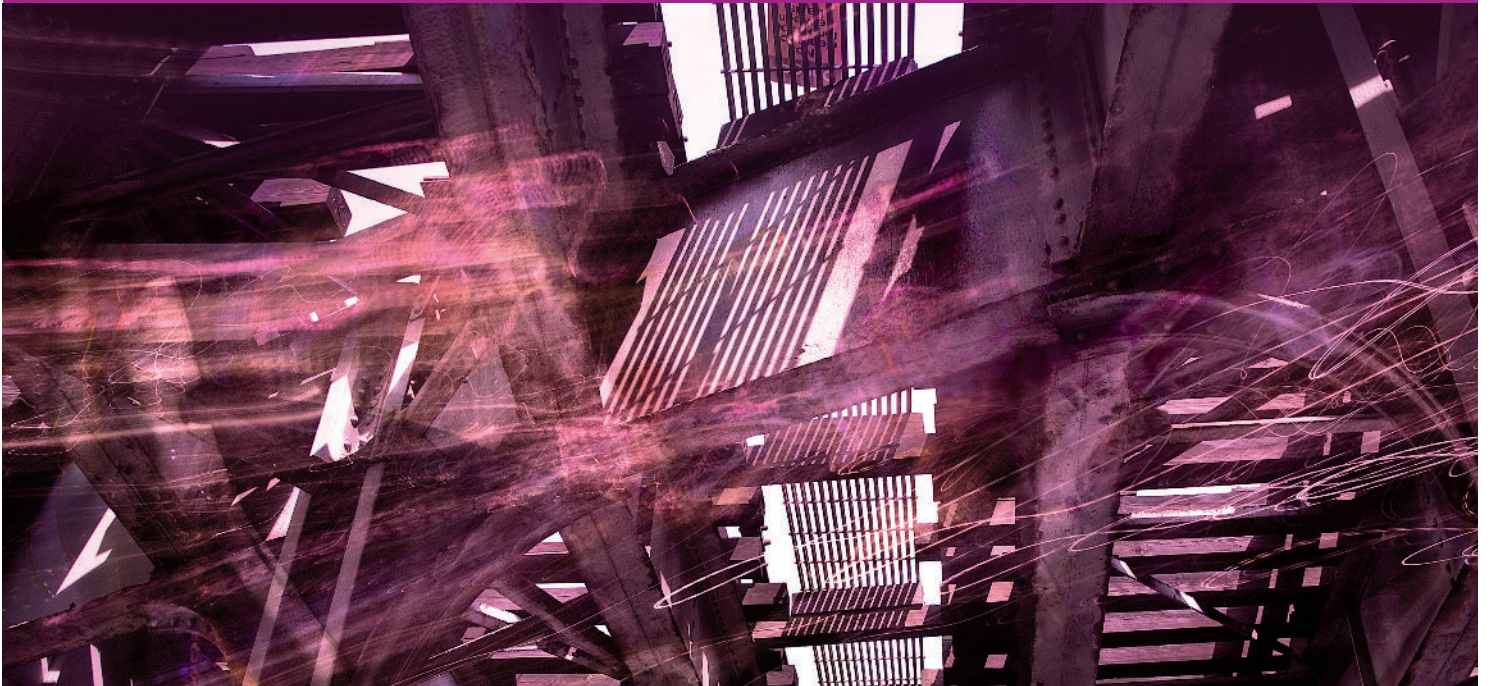
11 Even though you can record the print settings and Print dialog parameters in an action, I find it's also useful to create a custom preset for our printers. In this case, I named the preset to indicate the printer and paper. I chose the option to make the preset only available for this printer so I wouldn't accidentally use this preset for any of our other printers. Saving out custom settings is also available in most Windows drivers. The last step? Print!



I am at the stage where about 80% of the time, my first print is a keeper (Martin's not telling). Following these steps to printing won't guarantee you'll become a digital printing master – that takes time and practice. But each of these steps is important to the goal of producing excellent fine-art digital prints.



Photograph: Jeff Schewe.
Sinar 8 x 10 camera | Ektachrome 64 | Drum scanned | Shot with Balcar lighting.

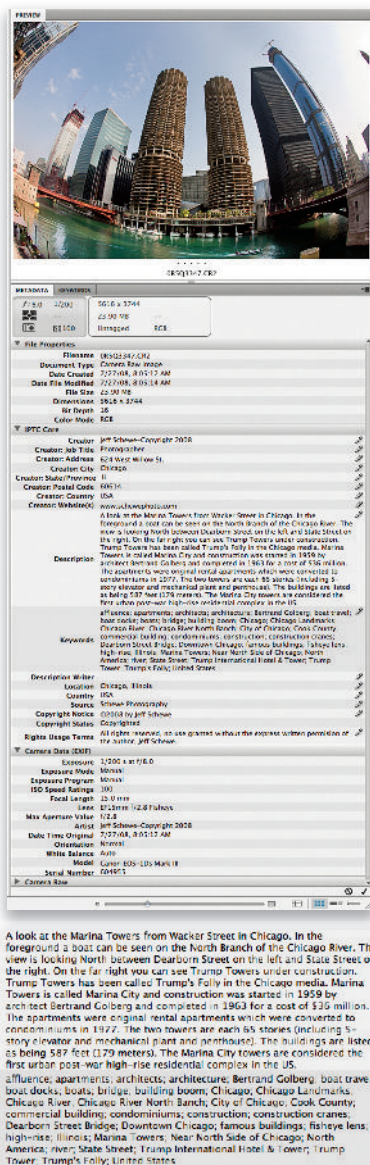


Chapter 13

Minding your own business

Suggestions on how to use Photoshop in your business

For a business to prosper there must be a profit, for if you don't turn a profit you won't be in business for long. Artists have historically been poor business people, in part because there is an assumed conflict of interest – if you do what you do for love how can you put a price on it? But that's exactly what you must learn to do. Ironically, the real value of your work has little to do with how difficult it was to do and more to do with how much perceived value it has by others. That is the key to understanding how to profit by doing what you love to do. And don't be afraid to put a high price on what you do, there's nothing wrong with being a business person as well as an artist. It's what we do... (and we love it, right?)



The keyword and caption detail

Figure 13.1 This figure shows an image shot by me in Downtown Chicago (which is one of the keywords) being displayed in Bridge CS5. Note, the background has been made white for the purposes of this figure.

Adding value to your images

Digital images, on their own, certainly have intrinsic value. But with extensive keywording and captioning, the same image is potentially far more valuable. Many people think of metadata (data about data) as merely an organizational aid without realizing how much value can be added to the image. Our good friend and colleague Seth Resnick strongly advocates extensive keywording and, just as importantly, captioning of the image. Seth does this primarily because he's so anal but also because he depends on the stock sale of images where metadata is an asset when potential buyers are doing image searches. So, for him and many others competing in that industry, adding metadata is a must.

The image shown in Figure 13.1 has 35 keywords (about average for a well-keyworded image intended for stock photo submission) and has almost 150 words in the caption (called Description in Bridge CS5, but we still think of it as a caption). Seth has boasted of having images that needed over 100 keywords for completion. We rarely go that far.

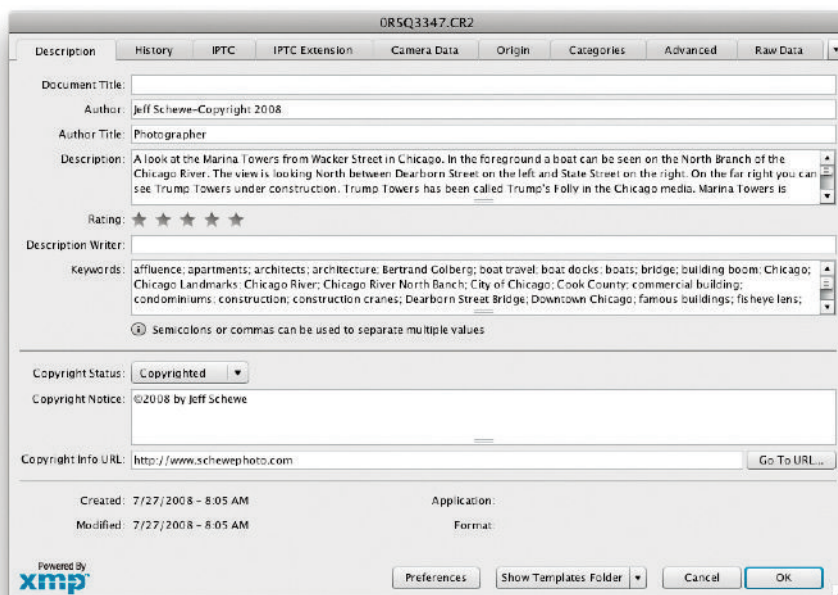
How do you keyword? One of the best tips from Seth is first write the caption (the story) and remember the who, what, when, where and why of journalism. When you write the story many of the keywords will come from the story itself. When adding keywords, be sure to list word variations and alternative spellings, such as color and colour. Use gerunds (verbs that function as nouns) and participles rather than verbs, such as *running* rather than *run*. Try to use the plural rather than the singular form of a word unless the plural spelling is different than merely adding an 's', in which case add that word as well.

Some keywords can be conceptual attributes, but use these very sparingly because overuse will make them useless. Everybody thinks their own work is 'beautiful' so *beautiful* as a keyword is pretty useless. Above all, be consistent in your approach and, if you are a poor speller, keep a dictionary handy. There's nothing quite so embarrassing as misspelling a keyword for the world to see. Using a 'controlled vocabulary' is critical; for more information about developing your own keyword vocabulary, see the website run by photographer David Riecks (www.controlledvocabulary.com).

Identifying your images

It used to be pretty easy to stamp slides with your name and copyright info but doing so with digital images isn't so straightforward (although arguably easier). But for your own sake please be sure to properly embed metadata in the IPTC schema (which stands for International Press Telecommunications Council). While we are still in the relatively early days of extensive metadata development, it's a viable method of identifying your work. If you don't do this you will end up producing what are known as 'orphan works' (see page 473).

You can add metadata using direct text entry in Bridge CS5 or in the File Info panel (see Figure 13.2) in Bridge or Photoshop (or the other applications in the suite – they all support IPTC now). But that's really the slow and inefficient method. We like to use Metadata Templates. Adobe has souped up the XMP (which stands for Extensible Metadata Platform) support in all of their CS5 applications and well they should, since Adobe initiated this free metadata standard. It is based on XML (Google it) and is the basis of the World Wide Web.



The .xmp file icon

Figure 13.2 This figure shows the File Info panel that contains the metadata of the Marina Towers image. Notice that I have marked the status as Copyrighted and added the digital copyright notice – the two most important metadata properties of identification.

File organization methods

The old days of filing cabinets with slide pages are long gone. These days, all of the image organization happens in the computer. If you have good organizational skills and take advantage of using metadata, organizing images is not impossible (just tedious). Jeff does not rename his original image files, he has adopted a logical folder naming convention and relies upon keywords and other metadata to organize his work as shown in Figure 13.3.

Martin's approach is similar to Jeff's except when it comes to client job work, where everything is renamed using a standard naming convention where the abbreviated client name is followed by the capture date (using the YYMMDD format), followed by a four-digit serial number (see Figure 13.4). There are several reasons for adopting this approach. By choosing a regular renaming scheme, it can become easier to identify files by client name and date (it is important to be consistent in the client naming, of course). Four digits is usually enough to cover all the numbers of shots that he might shoot for a client in any year. Martin will start from zero for the first shoot of the year and keep the numbers running consecutively for all subsequent shoots with that client. It is important to carry out such renaming as soon as the files are brought into the computer (see Figure 13.4). So, if a client selects a particular photo via the screen, the name that's referenced is one that stays with the file forever. By including the client name in the renaming scheme this reinforces 'ownership' of the file name.

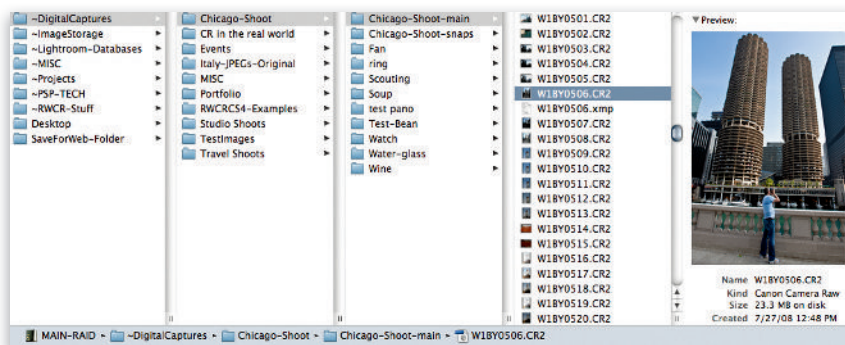
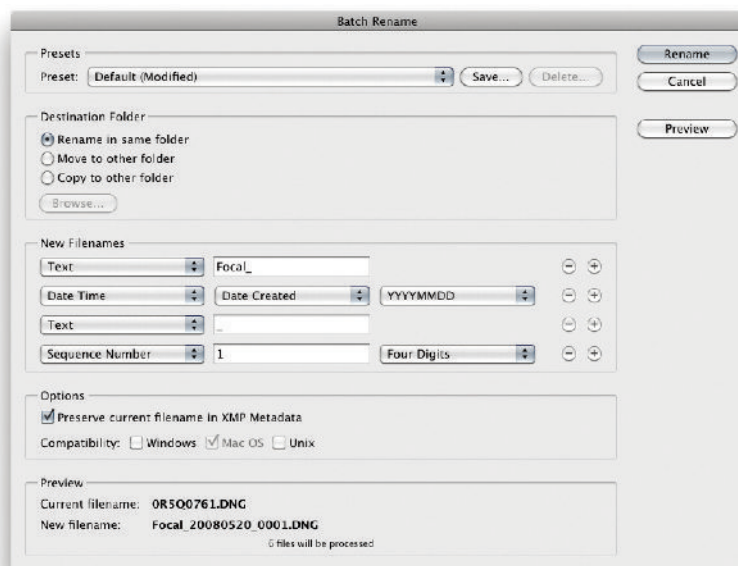


Figure 13.3 Jeff organizes all captures in an enclosing folder ~Digital Captures and uses upper level folder names such as Events, Portfolio, Studio Shoots and Travel Shoots for the main structure. The Chicago-Shoot was the project shot for this book. You'll note the raw file is still a .CR2 file. Jeff only converts to DNG when he has to deliver a DNG file. All delivery files are renamed using Bridge and the original raw file name is preserved in the metadata.



Batch Rename Preset drop-down menu

Figure 13.4 This shows the file renaming method one might apply using the Tools ⇨ Batch Rename... feature in Bridge. Batch Rename in Bridge CS5 now has the ability to save renaming presets to allow consistent Batch Rename settings. Note that the option to Preserve current filename in XMP is checked.

One of the problems Martin found in the early days of shooting digital was that if you didn't rename the images, clients would often rename them for you. There was one client who would ask for prints to be made from 'hairshine-blondet.tif' or some other descriptive name that had been applied to the original retouched images. It all got very complicated trying to work out which exact shots they were talking about.

This is just one way of renaming. In *The DAM Book*, Peter Krogh suggests renaming everything with your name first rather than the client's. This kind of naming scheme immediately makes it clear who is the copyright holder before the image is opened. Peter also suggests using the embedded filename instead of allocating a four-digit serial. The reason for this is that if all your jobs are renamed starting from 0001, your files will all end up renamed within the same low number range. If you use the embedded numbers, fewer of the filename numbers will end up being identical. Hence, if a client can only give you the last four digits you should be able to do a filename search and quickly figure out which image they are referring to.



Figure 13.5 Me sitting at the temporary home of my old Mac G4 running System 9.2 and Retrospect 4.2. I was restoring image files from as far back as 1993 for this book that were stored on DAT tape.

Archiving issues

Backing up is not archiving!

Archiving is really the process of long-term conservation and preservation. While you do want to do weekly or daily backups, that process does not ensure long-term viability and availability. In film days, we used to worry about film lasting decades or centuries but with digital the process is complicated by file formats, operating systems and hardware that go out of date and cease to be supported. Unfortunately, at the moment the bad news is there are no good long-term archiving solutions for digital photography. Major institutions such as the National Archives in the US and UK are studying the problem, but there isn't any good news to report. The best advice we can offer about this issue is to maintain multiple copies on multiple media in multiple locations and get into the habit of updating and migrating your image data as new technologies become available.

By multiple media we include tape, hard drives and burnable media like CD or DVD. The long-term prospects of these media are not good. I used to archive first on DAT tape then AIT tape until suffering enough media problems that I gave it up. I still have all of the old DAT and AIT tape archives. For this book I had to resort to pulling up original image files from as early as 1993 (see Figure 13.5). To do so I had to set up an old Mac G4 that I kept around for this purpose. The figure shows me loading a DAT tape while running Retrospect 4.2 and Mac OS 9.2. I've been unable to find SCSI cards that allow me to use the old SCSI DAT drive on any current machines and current DAT drives have problems reading old media that they didn't write.

But the problem going forward is worse than it was back then. Back in the film and scan days, only selected images were actually scanned and you always had the film to fall back on. Now with digital capture, all of the originals are digital objects that must themselves be preserved and maintained – and for long-term considerations the file formats themselves need scrutiny.

Shortly before Adobe shipped the original Creative Suite (CS) Bruce Fraser and I were warned by then Adobe engineer Mark Hamburg (who had since left Adobe but has now returned) that the Photoshop 'native' file format, PSD, wasn't under Photoshop's control anymore and suggested we switch to using TIFF.

The Tagged Image File Format was originally developed by Aldus with input from a few other companies. Ironically, Adobe inherited the format when it acquired Aldus and has done a reasonably good job of moving it forward (although not updating the TIFF 6 spec). But if you want to store processed image files for the long term, we suggest TIFF because it is publicly documented.

But that's for processed files – what about original raw files from a camera? For that we support Adobe's DNG (Digital Negative) file format specification. Adobe has essentially 'given' the DNG file format to the industry and even gone to the extent of offering it (for free) to the ISO for use in an upcoming TIFF-EP specification update (TIFF for Electronic Photography). Ironically, Adobe had already granted the ISO the right to use TIFF in the ISO TIFF-EP specification and it's that spec that pretty much all of the major camera makers such as Nikon and Canon already use. Yet the majority of the camera makers so far have refused to adopt any standard (their use of TIFF-EP is unofficial so they are free to diverge from the spec if they so choose, and they do). Recent camera releases have, however, seen adoption of DNG by some camera manufacturers, notably Pentax by offering a DNG file format writing option and Leica by adopting DNG as its native raw file format.

For the long-term preservation and conservation of digital photography the industry simply must adopt raw file format standards. While traditional chemical photography originals can be accessed from the 19th century, there's a real question whether digital photography since the beginning of this millennium will be so enduring. There are already some early raw file formats that have been orphaned by their original manufacturer.

The United States Library of Congress has studied long-term conservation of digital objects and has identified seven major factors that impact long-term digital preservation and conservation (see sidebar). All of the current proprietary raw file formats (except DNG) violate most, if not all, of these factors. We therefore encourage our readers to support DNG, and wherever possible have your voices heard by the camera makers that proprietary, undocumented raw file formats need to be eliminated. We wish to be clear about one thing: neither of us is suggesting you convert to DNG and toss out your original proprietary raw files. We suggest both using DNG (where appropriate) and keeping your original raws.

The seven sustainability factors

From www.digitalpreservation.gov

Disclosure:

Refers to the degree to which complete specifications and tools for validating technical integrity exist and are accessible to those creating and sustaining digital content.

Adoption:

Refers to the degree to which the format is already used by the primary creators, disseminators, or users of information resources.

Transparency:

Refers to the degree to which the digital representation is open to direct analysis with basic tools.

Self-documentation:

A digital object that contains basic descriptive metadata and incorporates technical and administrative metadata relating to its creation and early stages of its life cycle, will be easier to manage and monitor for integrity and usability and to transfer reliably from one archival system to its successor system.

External dependencies:

Refers to the degree to which a particular format depends on particular hardware, operating system, or software for rendering or use and the predicted complexity of dealing with those dependencies in future technical environments.

Impact of patents:

Patents related to a digital format may inhibit the ability of archival institutions to sustain content in that format.

Technical protection mechanisms:

Content for which a trusted repository takes long-term responsibility must not be protected by technical mechanisms such as encryption, implemented in ways that prevent custodians from taking appropriate steps to preserve the digital content and make it accessible to future generations.

The DAM Book

If you want to find out more about image management using Adobe Bridge, Lightroom and Microsoft Expression Media, we highly recommend that you read: *The DAM Book, Digital Asset Management for Photographers, Second Edition*, by Peter Krogh, ISBN-13: 978-0596523572.

RAID

RAID, which stands for Redundant Array of Independent Disks, is often thought of as some sort of magic bullet for data protection. Not really. RAID level 0 stripes data across multiple drives for speed at the expense of safety. If you lose one drive you lose all your data. RAID 1 (mirrored arrays) is safer but slower. RAID 5 and 6 use one or more of the drives for parity to rebuild the array should a drive fail. But they are sometimes proprietary processes and if you lose the RAID hardware, you can't read the drives, so it's only a risk reduction strategy. NAS or Network Attached Storage is catching on and the units often use RAID 5, but even gigabit Ethernet is much slower than fast eSATA drives, and you are at the mercy of the network and its built-in embedded OS, usually running a Windows variation that may not support fully AFP (Apple File Protocol) connections.

Backing up your data

When managing your digital images, the most important thing is to make sure you have a backup procedure in place that can be relied upon in the event of a disaster, such as a hard drive failure or theft of a computer. If you don't have too big an image library, this could be achieved quite simply by having a single hard drive connected to the computer that you can back up your files to. At a more advanced level, you could invest in a mirrored RAID storage system where the data is mirrored across two or more drives of equal capacity. If one of the drive units were to fail, the data is protected on the backup drive, so you can simply replace the defective drive and the data is mirrored across to the replacement drive again. But be warned that mirroring the data in this way is still not entirely foolproof. However you choose to back up your data, the following points should be borne in mind.

Scheduled backups are most important because it is important to have a buffer between the contents that are on the current working drives and the backup versions. It is all too easy to delete a file or discover you need to revert to an earlier version of a file. If you make a mistake on a mirrored RAID system, the mistake will soon be mirrored to the other drive. But if you also maintain a copy on a separate backup drive system, there should always be a recent backup copy of the data ready for you to access. As a Macintosh user, Martin likes using the Chronosync utility (Figure 13.6) to make regular backups of his computer files. It's a fairly easy program to use and can automatically cross-reference the files on your computer drives with those on the backup drives to auto-synchronize the two. Jeff, on the other hand, has been using Retrospect® from EMC®, originally for writing to tape drives and more recently for doing incremental nightly scheduled hard drive backups using scripts. Jeff has used the searching function of Retrospect extensively either by date or enclosing folder naming.

Where do you store the backup data? If you keep the backup data on separate hard drives, it is not too difficult to keep these backup drives stored in a safe location away from the computer, such as in a fireproof safe, or off-site somewhere. One approach is to use two additional drives for every drive you wish to back up. That way you can keep one backup drive at the office, the other at a separate location, and keep swapping the two backup drives. For absolute security, some people back up all their data over a

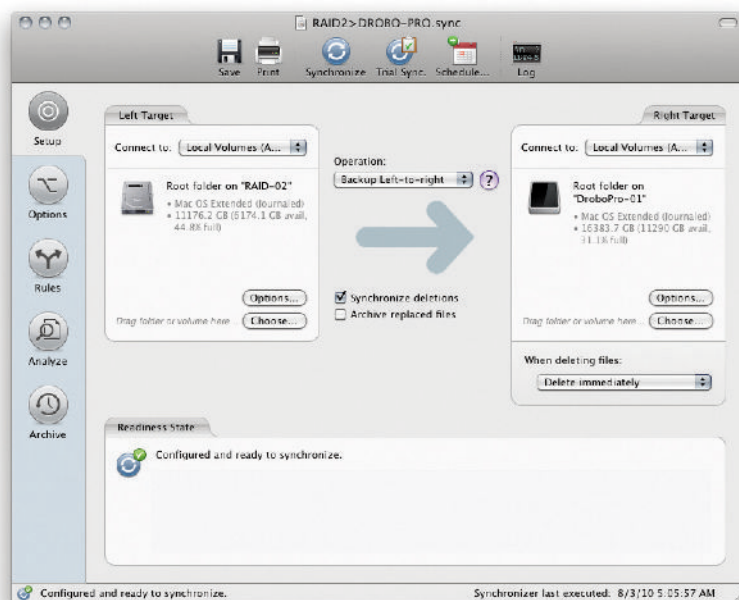


Figure 13.6 Chronosync™ from Econ™ technologies (www.econtechnologies.com) is an indispensable tool for carrying out data backups.

fast Internet connection to a remote server. In the writing of this book, the InDesign files and images were constantly backed up to a remote server and updated files were obtained by each author. This allowed Martin and Jeff to work remotely and, given their time zone differences, Jeff would be ending his day by uploading files to the server for the start of Martin's workday. A simple email was used to alert each other to the updated files rather than trying to email actual files.

Hard drives can provide storage space that is fast, cheap and high capacity. But they can still be vulnerable to things like a virus attack. It may take a while to burn copies of your data to CD or DVD, but while such media may not be completely infallible, your data won't be vulnerable to virus attacks. So far, neither author has adopted Blu-ray burners into his scheme. While single layer, 6× 25GB Blu-rays disks have fallen in price (about \$3.50), the write speed is still pretty slow compared to 16× for DVDs. Also the price of the Blu-Ray burners remains much higher than DVD burners. We are still on the sidelines and use hard drives.

DVD storage

Recordable DVD drives have become increasingly popular and are often supplied as standard with some computer models. Recordable DVD discs are capable of storing 4.7 GB of data. But again, to be realistic, I would knock that figure down to something more like 4.3 GB as the actual amount of data you can store on a disc. The only problem with a DVD (or CD) is that if it gets damaged you lose everything and that might mean losing a hefty chunk of valuable data. So don't rely entirely on DVD as a backup method. Recordable discs also have a finite life-span. And who is to say if DVD, or the new Blu-ray standard, will not be superseded by some other form of recordable media requiring a different type of hardware device to read the data? Furthermore, if you archive raw camera files without converting them to the DNG format, will you always have the software to interpret these? In this industry a lot can happen in a matter of just a few years. For example, does anyone now remember Syquest disks? We are hoping that Blu-ray may end up as a viable medium, but we certainly hope you didn't back up to HD DVD, the standard Toshiba was promoting that died in early 2008. But then we still don't know about the long-term viability of the media.

Fingerprint plug-ins

Software solutions have been developed to provide better data protection and security, giving suppliers of electronic data the means to identify and trace the usage of their intellectual property. These systems apply an invisible 'fingerprint' or encrypted code that does not spoil the appearance of the image but can be read by the detection software. The code must be robust enough to work at all usage sizes: from screen size to high resolution. It must withstand resizing, image adjustments and cropping. A warning message should be displayed whenever an image is opened up alerting the viewer to the fact that this picture is the property of the artist and a readable code embedded from which to trace the artist and negotiate a purchase.

Two companies have produced such encryption/detection systems: SureSign by Signum Technology and Digimarc by the Digimarc Corporation. Both work as plug-ins for Photoshop. They will detect any encrypted images you open in Photoshop and display a copyright detection symbol in the status bar alongside the file name. You have to pay an annual usage fee to Digimarc to register your individual ID (check to see if free trial period offers are in operation). Anyone wishing to trace you as the author, using the Photoshop Digimarc reader plug-in, will contact their website, input the code and from there read off your name and contact number. SureSign provides a unique author code plus transaction number. In my opinion, the latter is a more adaptable system.

Image protection

Anyone who fully understands the implications of images being sold and transferred in digital form will appreciate the increased risks posed by piracy and copyright infringement. The music industry has for a long time battled against pirates duplicating original disks, stealing music and video sales. Digital music recordings on CD made this problem even more difficult to control when it became possible to replicate the original flawlessly. The issue of piracy is not new to photographers and image makers, but the current scale of exposure to this risk is. It includes not just us Photoshop geeks, but also anyone who has their work published or is interested in the picture library market.

To combat this problem, the first line of defense had been to limit the usefulness of images disseminated electronically by (a) making them too small in size to be of use other than viewing on a screen and (b) including a visible watermark which both identifies the copyright owner and makes it very difficult to steal and not worth the bother of retouching out. The combination of this two-pronged attack is certainly effective but has not been widely adopted. The World Wide Web contains millions of screen-sized images, few of which are protected to this level. The argument goes that these pictures are so small and degraded due to heavy JPEG compression, what possible good are they for print publishing? One could get a better pirated copy by scanning an image from a magazine on a cheap flatbed scanner. Shopping is now replacing sex as the main focus of interest on the Internet, so screen-sized web images do now have an important commercial value in their own right. Furthermore, the future success of digital imaging and marketing will be linked to the ability to transmit image data. The technology already exists for us to send large image files across the world at speeds faster than DSL. Once implemented, people will want to send ever larger files by telecommunications. The issue of security will then be of the utmost importance.

How to make money with Photoshop

How much are you worth?

Creative workers and, in particular freelancers often have difficulty in working out what they're worth and how they should go about charging for the services they provide. Retailers sell goods, taxi drivers sell cab rides, while bankers look after our money. At the end of the day, an employee is simply selling their time and their worth is calculated based on how much their work skills profit the employer. OK, in the case of investment bankers, they screw up the economy and look to the tax payer to bail them out of difficulty, but as far as many workers are concerned, they are essentially all selling their time.

The problem a lot of freelancers have is that they fail to take into account how much time and money is required to run a business. They fall into the trap of confusing freelance income rates with the rates of pay given to full-time employees. There is a big difference. If you work for a company, you cost your boss a lot more than your take home pay check. A company has to provide its workers with premises to work from, light and heating, computer equipment, plus maybe a subsidized canteen, not to mention all the other side-benefits such as a company pension contributions and sickness benefit. So, when you start out on your own and become your own boss, you have to take responsibility for all these added expenses. On top of this you have to fill lots of other roles such as finance director, marketing manager, bookkeeper and coffee maker. So, when calculating how much you need to charge, you first need to work out how you are going to fulfill all these tasks on top of doing the actual work you set out to do as a freelancer.

Let's start with the assumption that you will work a basic 40-hour week. I know most freelancers will work a lot more hours than this, but we need to begin with a sensible business projection that allows us to compare the way you work as a freelancer with the way most other employees are expected to work. Here's how things should break down. If you want to be realistic, you should expect to spend half that time working on freelance commissions and the other working on all the other jobs that are part and parcel of running a self-employed business. So, you might typically only be able to spend 20 hours on average per week working on

Finding an agent

Some people argue that having the right agent can make a tremendous difference to a career. An experienced agent can help nurture creative talents and provide an umbrella that allows the artist to get on doing what they do best, while the agent takes care of managing the job bookings and ensuring that you get paid the best rates, often asking for more money than you might dare ask for yourself. For advertising work, having an agent makes good sense. The fees are substantial enough that everyone usually gains from this type of arrangement. The downside of having an agent is that some agencies will say yes to any kind of job, even if it pays below the market rate. From the agent's point of view, an editorial commission that pays only \$150 is still worth \$30 to them plus a \$30 booking fee. Editorial bookings are usually the simplest ones for them to manage, as all they have to do is pick up the phone and take the booking. The freelancer, meanwhile, is the one who has to do all the work, in order just to make themselves \$120. Remember, for an agent to invest their time promoting your talents, they will expect you to be willing to do the work they find for you. An agent can take your career in a whole new direction. This can be a good thing if it gets you good work and earns you decent money. For some people it may mean losing control of the direction they wish to take their career in. So think carefully about what you wish to achieve from such an arrangement.

paying commissions, while the other 20 hours will be spent doing everything else. You don't believe us? Well, think about it for a second. In the early years you will need to spend at least one day a week between sitting down to make calls to make appointments to show your work and going out to see prospective clients. When you get commissioned, you will be asked to send your portfolio in again or spend time making presentations to clients. There will be day-to-day telephone calls to deal with. There will be invoicing work to do as well as bill chasing. Then there are meetings with professionals such as bank managers, accountants and lawyers. What about training? You need to allow time to catch up with the latest news from the forums and attend seminar events to learn more about Photoshop. In fact, shouldn't reading this book count as work? Here is a brief summary of some of the things you might spend time doing:

- Self-promotion: making appointments
- Advertising/website
- Client telephone calls
- Creative research/monitor email forum activities
- Office administration
- Bookkeeping and accounts
- Business meetings
- Seminars and training

If you estimate that you'll spend 20 hours a week on average per week working on commissions, this works out at 1000 billable hours per year. Therefore, if you add up all your likely annual business costs, you can add on to this how much salary you would like to earn, then simply divide this figure by 1000 to calculate what your hourly rate should be. Now, we do realize you'll be offered jobs where the rate offered is a set fee that pays less than this rate, but at least you can use this as a guide to work out what you should be earning. Like most freelancers, you'll probably end up working a lot more than 40 hours per week, which is fine, as long as you are doing so to earn a better living. The above calculation is also based on an individual setting themselves up from scratch as a sole trader. Once you become more established, you can afford to allocate some of the job responsibilities to a personal assistant but then, of course, you'll have to factor in the

costs of employing someone and that too will affect how much your hourly rate should be. Here is a brief summary of things that your freelance fees will need to pay for:

- Rent of business premises
- Equipment costs
- Insurance
- Telephone
- Office supplies
- ISP service, including server hosting fees
- Travel
- Training expenses
- Professional fees
- Heating and lighting
- Pension, income protection and health insurance

Your rate is your rate

Once you have worked out your daily and hourly rate, we recommend you stick firmly to it. You have worked out what you should charge based on the minimum amount you need to earn in order to keep your business ticking over, plus what premium you think your skills are worth, and it is therefore in your best interests to hold firm and not waver on that. However, there will come times where you'll be asked to work for less than the going rate. There is a real simple question that you can ask yourself before you take on any job: is it a job for the portfolio or a job for the bank? Most the time the answer will be it's one or the other. Either you want to accept a commission because you reckon it will be a nice job to work on and look good in your portfolio, or you want to do the job because it's a chance to earn some decent money. The best assignments are the ones that provide good money as well as artistic freedom, but you definitely want to avoid cutting your rates to do jobs that pay you less money than you are worth or need to live on, plus do nothing to raise your profile. The reality for some people is that when times are tight you have to swallow your principles and do anything to keep the cash flow ticking over, but whatever you do, be on your guard against those clients who are willing to take advantage. In our experience, the clients who pay the least are the ones who also take the longest to pay (it's true). If you do agree to work for less than the standard hourly rate, then

Editorial rates

Editorial magazines probably offer the lowest rates of pay. In fact, there are a lot of fashion magazines that expect you to work entirely for free, in return for a credit. As we point out, this type of work is only worth doing if it offers a good market place in which to show off your skills and helps you get good published work for your portfolio. We advise you to keep this in mind before taking on these kinds of jobs. We know lots of people who have got sucked into the cycle of working on endless free editorial jobs, where they don't even particularly enjoy the work that they are asked to do.

here's a tip. Never agree to charge less. If you simply invoice the lesser amount, the client will see this as the rate you charge for everything. Instead, you should propose to charge your normal rate, but offer a special discount on the invoice for whatever reason seems appropriate. That way, you make it clear from the start what your rate should be and that the client is getting a special discount this time only. Clients like this kind of arrangement because ultimately they get the saving they wanted and not only that, they feel good because they see the saving shown to them on the invoice. They'll also have more respect for you and are reminded of how much your services are normally worth. When it comes to getting more work from the same client, the starting point for your quote will be the standard day rate again, rather than the lesser amount you actually charged, and you can therefore negotiate from a position of strength if they come back to you with offers of more work.

How to bill for digital

With the advent of digital capture, clients are under the delusion that everything should be cheaper, right? Hey, pixels are free (once you've bought that \$8K camera and that \$5K computer system and all the other stuff you have to have in order to capture those 'free pixels'). No, in fact while there may be fewer direct costs with digital compared to the old film and processing days, there are actually much higher indirect costs in the equipment needed. So, how can you possibly consider giving your digital services away for free? But it's not up to us to tell you what to charge, just the factors to consider when you do decide.

Seth Resnick makes out a good case for charging a flat fee for all digital work. He'll offer a breakdown whose à la carte totals are more than what he expects to charge and a flat fee that is what he actually wants to charge. Most clients choose the flat fee but he's happy to charge by the service. Jeff on the other hand likes to break things down to their elemental costs. If something costs him something, somewhere, he wants to have an actual price for that cost and pass it along to the client. In Figure 13.7 you'll note that he is proposing to charge \$1.25 per capture made. Sure, there will be four shots with 200 captures/shot and the total price would be \$1000, but when priced at \$1.25 it doesn't seem so high. You'll also note that he is charging for CMYK separations and proofs, burning

to DVD (he would charge for digital transmission if needed) and even for storing the files. Figure 13.7 shows Jeff's estimating software built on FileMaker Pro which he uses for all jobs.

Whatever you do decide to charge, just know that as a good business person you are expected to charge something because if you don't, the implication is that there's no value attached – and clients ultimately expect value and will pay.

The screenshot shows the SCHEWE ESTIMATES software interface. The top bar includes a search bar, a record count of 33, and buttons for Show All, New Record, Delete Record, Find, and Sort. The main form is divided into several sections:

- VIEW:** A sidebar on the left with buttons for SIMPLE, SUMMARY, DETAILS, T&C, PRINT SIMPLE, PRINT DETAILED, and COVER LETTER.
- Form Fields:**
 - date: 8/3/2010
 - To (full name): Cool Doode
 - last name: Doode
 - first name: Cool
 - title: Chief Mucky Muck
 - agency: Doesn't Really Exist
 - address: 1 Nowhere Street
 - Anywhere USA
 - phone:
 - Art Director: Cool Doode
 - Art Buyer: Cheap Doode
 - Client/Product: Some Big Corporation
 - Job Description: The is a sample estimate for that big job that I probably won't get even though I've estimated 10 different layouts. Too bad I won't get the job, the AD said I was "creative choice" and I would have made a ton of money but of course the job will go to the cheapest bid. The low bidder will also probably sign away all rights to the images and not charge for the digital work. The client probably won't pay the poor guy for 120 days. The low bid will probably screw up the CMYK conversions and the client will have a complete hissy fit with the agency and the art director will blame the art buyer and account exec for going with the lowest bid. The final ad will look like crap in the magazines.
 - Record type: Agency
 - Estimate #: 10th
 - Job #:
 - P.O. #:
- Table:**

	# shots	Quantity	Price	Cost	Subtotal	Lab Total
22MP Digital Captures	4	200	1.25	-0-	1000	3425
Image Retouching	4	4hrs.	100/hr.	-0-	1600	
Prepress Conversion to CMYK	1 each	4	75	-0-	300	
Cross-Rendered Proofs to size	1 each	4	100	12	400	
Burn to DVD	1	1	50	.25	50	
Online Storage for 90 days*					75	
- Buttons:** ADD ESTIMATE, FIND ESTIMATE, DO INVOICE, END OF PAGE.

Figure 13.7 This is a sample estimate prepared (in jest if you can read the description) showing an example of how to charge for digital. It should be noted that Jeff is not suggesting you actually charge these rates – these are not Jeff's real rates – they are simply an example of how you might break down the charges to a client. When breaking down the charges, be prepared to explain and, if need be, defend them. Clients fully expect to have to pay for value (sometimes they just like real cheap prices) so you need to be prepared to educate them on the value attached to what you charge.

Protecting your rights

If it was easy to make a living out of photography and working in Photoshop, we could all be rich doing what we enjoy most. The real world provides plenty of obstacles to ensure that only those who are talented enough and persistent enough are able to make a decent living from freelance work. Not everyone is going to be interested in turning their photography into a full-time career, but there are a number of pitfalls that are useful to bear in mind that can help you from being exploited.

Back in the mid-eighties, a fellow photographer, Mike Laye, helped initiate a UK campaign to ensure that photographers were automatically granted copyright ownership of their photographs. I remember Mike enjoyed telling the story of how he first got thinking about the need for photographers to be better protected under the law. A British magazine had asked him to photograph the singer Demis Roussos. ‘Demis who?’, you ask. Well, he used to be a big star in the seventies, but by the eighties his musical career had all but dried up, which was around the time when Mike was asked to photograph him. A few years later though, and Demis Roussos was one of the passengers on a hijacked TWA flight – the papers were all clamoring for recent photos taken of him. That’s when Mike saw the photo he had shot a year or two previously appear on the front of nearly every major newspaper. He soon learned that although he had taken the photo, under UK law (as it was then) he was not automatically recognized as the copyright holder. It was the magazine, and not he, who owned the photo. They probably made a killing out of all the syndication fees, while Mike didn’t receive so much as a penny (or cent).

Among other things, this story illustrates how the value of any image can be unknown. You never know if a photograph will acquire a greater worth in the future, which is why it is a good policy not to give away your copyright away unless someone rewards you handsomely for it. Freelancers are always going to be pressurized to undersell themselves and assign full copyright, but we have both managed to find work and made good incomes without giving up our copyright. OK, we have also lost some work through being obstinate, but it’s not always such a bad thing to lose the odd commission. In the long term we believe you will gain more respect if you stick to your guns and don’t sign away your rights.

One thing you should aim to do is to always make sure every photograph you take is marked as being copyrighted. As was

mentioned earlier in this chapter, this is a basic means by which you ensure that any photographs you subsequently distribute are seen to be copyrighted. This does not guarantee that no one will edit the copyright status, but it does at least let all the honest users of photography know who owns a particular photograph.

It is also interesting to consider who owns the copyright in a retouched photograph. Is it just the photographer, or does the retoucher have shared rights? We would suggest that in most cases it is the photographer only, but there are instances where a substantial amount of retouching can be considered to be effectively adding completely new content to an image. This could be regarded as work that has a separate copyright ownership.

Orphan works

An orphan work is a copyrighted work whose owner is unknown or impossible to identify. The US Copyright Office has been working to address the issue (which is a real problem) and new legislation governing orphan works is to be introduced that may make it easier for potential infringers to claim they could not identify or find the owner and thus escape some of the penalties of copyright infringement. Without commenting on that issue, we will say it now becomes even more critical that copyright holders avail themselves of the current metadata opportunities and never send out any digital images without having embedded their copyright notice as well as contact information in the file.

Image harvesting

Companies love having the opportunity to get hold of images for free usage and little cost to themselves. It's all down to enticing people to submit photographs through the promise of exposure and in return getting them to sign away the rights associated with those photos. A classic example is the way a TV network might ask you to submit photos of, say, the weather today where you live. If you read the terms and conditions carefully you'll probably note that you are about to provide a free non-exclusive license for the TV network to use the photos you submit, any way they wish.

A more insidious form of image harvesting is photo competitions where the organizers ask photographers to assign full copyright to them as a condition of entry (see sidebar about the Pro-Imaging Bill of Rights for Photography Contests campaign).

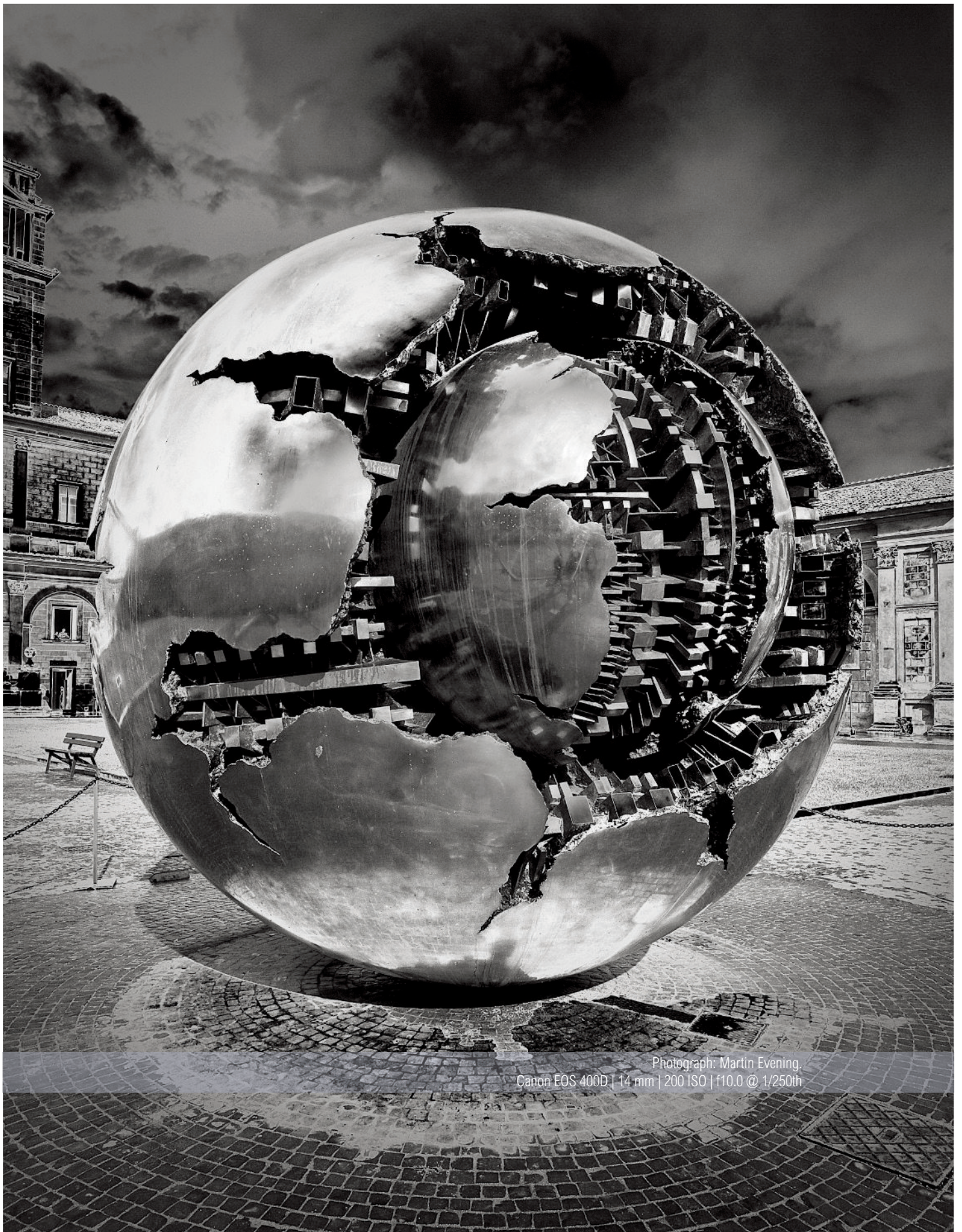
Uploading photos and orphan works

Another thing to watch out for is that you don't create an orphan work in the process of uploading photos to a social networking site. It has been pointed out that some sites where you can upload photos to may remove important metadata such as the copyright information.

Websites such as Flickr, on the other hand, do appear to preserve all of a file's metadata information. If anything, they expose rather more details than you would expect, such as the software used. For Adobe software testers such as ourselves, this can be potentially rather embarrassing if you are working with prerelease Adobe software that hasn't been officially released yet! What I personally like about Flickr is the fact that all the metadata I regard as important is always preserved.

Pro-Imaging Bill of Rights

Pro-Imaging is a non-profit, web-based organization for people working in the photography and imaging industries, where a condition of entry is that members do not sell royalty-free images. In 2008 they launched a Bill of Rights for Photography Contests campaign, designed to encourage competition organizers to adopt a 'fair business' approach that prevents unfair exploitation of photographs. For more information, go to www.pro-imaging.org. There you will find listings of approved and non-approved photography competitions (specifying onerous clauses in the competition terms and conditions). It is worth checking if you are thinking of entering a photo contest.



Photograph: Martin Evening.
Canon EOS 400D | 14 mm | 200 ISO | f10.0 @ 1/250th

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